ON AMERICAN APHIDS, WITH DESCRIPTIONS OF A NEW GENUS AND SOME NEW SPECIES (HOMOPTERA, APHIDIDAE)

by

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ABSTRACT

The following new taxa are described: *Acyrthosiphon pentatrichopus* spec. nov., from *Rosa fendleri* and *Rosa* sp., Utah and Colorado, U.S.A.; *Acyrthosiphon vandenboschi* spec. nov., from *Potentilla glandulosa,* California, U.S.A.; *Aphis agastachyos* spec. nov., from *Agastache urticifolia,* Utah and Idaho, U.S.A.; *Aphis astragalina* spec. nov., from *Astragalus* sp., Montana, U.S.A. and Alberta, Canada; *Aphis atromaculata* spec. nov., allegedly from *Ribes* sp., Oregon, U.S.A.; *Aphis baccharicola* spec. nov., from *Baccharis pilularis,* California, U.S.A.; *Aphis mulini* spec. nov., and *Aphis mulinicola* spec. nov., from *Mulinum* sp., Patagonia, Argentine; *Masonaphis magna* spec. nov., from Composites, Alberta and British Columbia, Canada; *Megourina* gen. nov., type-species *Megourina lagacei* spec. nov., from *Aquilegia formosa,* California, U.S.A.; *Pentamyzus falklandicus* spec. nov., from *Poa flabellata,* Falkland Isles; *Thripsaphis* (*Trichocallis*) *californica* spec. nov., from *Carex* near *C. comosa,* California, U.S.A.; *Thripsaphis* (*Trichocallis*) *hybrida* spec. nov., from *Carex* sp., California, U.S.A.; *Thripsaphis* (*Trichocallis*) *ossiannilssoni pacifica* subspec. nov., from *Carex* sp., California, U.S.A.; *Thripsaphis* (*Trichocallis*) *scabra* spec. nov., from *Carex* sp., California and Idaho, U.S.A.; *Thripsaphis verrucosa nodulosa* subspec. nov., from *Carex* sp., Alaska, U.S.A., and Labrador, Canada; *Thripsaphis verrucosa subverrucosa* subspec. nov., from *Carex* sp., California, U.S.A.; *Uroleucon sijpkensi* spec. nov., from *Solidago macrophylla,* Quebec, Canada. The following new synonymies are proposed: *Hyperomyzus boerneri* Prevost, 1959, and *Hyperomyzus sobrinus* F. P. Müller, 1966, of *Neonasonovia zirnitsi* Hille Ris Lambers, 1952; *Dactynotus pieloui* Richards, 1972, of *Uroleucon hieracicola* (Hille Ris Lambers, 1962) comb. nov., transferred from *Dactynotus; Thripsaphis gelrica* Hille Ris Lambers, 1956, of *Allaphis caricicola* (Mordvilko, 1914); *Callaphis* Mordvilko, 1909, type species *Callaphis caricicola* Mordvilko, 1914, and *Allaphis* Mordvilko, 1921 nom. nov. pro *Callaphis* Mordvilko, 1909 nec Walker, 1870, of *Thripsaphis* Gillette, 1917, type species *Brachycolus ballii* Gillette, 1908; *Thripsaphis thripsoides* Hille Ris Lambers, 1939, of *Allaphis caricis* Mordvilko, 1921. New combinations are: *Nearctaphis argentinaeradicis* (Gillette & Palmer, 1932), from *Aphis; Neonasonovia inflata* (Richards, 1962), from *Hyperomyzus; Neonasonovia fronki* (Knowlton, 1945), from *Amphorophora; Neonasonovia nabali* (Oestlund, 1886), from *Rhopalosiphum; Neonasonovia nigra* (J. McVicar Baker, 1934) (with a redescription of apterae), from *Amphorophora*; *Neonasonovia thorsteinni* (Stroyan, 1960), from *Hyperomyzus; Pentamyzus acaenae* (Schouteden, 1904), from *Rhopalosiphum; Neobacillaphis striata* (Bozhko, 1961), from *Thripsaphis; Uroleucon nigrotuberculatum* (Olive, 1965), from *Dactynotus; Uroleucon sonchellum* (Monell, 1879), from *Siphonophora.* The apterous viviparous female of *Masonaphis corylina* (Davidson, 1914), is described; *Aphis mimuli* Oestlund, 1887, is redescribed; and the host alternations of *Neonasonovia nabali* (Oestlund) and *Aphis ribiensis* Gillette & Palmer, 1929 are discussed. *Thripsaphis* (*Trichocallis*) *caricis* (Mordvilko, 1921), *Thripsaphis* (*Trichocallis*) *foxtonensis* Cottier, 1953, and *Thripsaphis* (*Trichocallis*) *producta* (Gillette, 1917) are distinguished as separate taxa. A key to the American members of *Thripsaphis* (*Trichocallis*), and to the subspecies of *Thripsaphis* (*Trichocallis*) *verrucosa* (Gillette, 1917) is given.

Acyrthosiphon pentatrichopus spec. nov.

Fundatrix.

Colour in life not known. In mounted specimen body rather broadly spindle-shaped. Tergum faintly sclerotic, not smooth, but wrinkled to irregularly reticulated, the head pale brownish yellow, the rest not pigmented. Distinct semiglobular marginal tubercles present on all thoracic segments and on abd. segments II—IV or V, and besides, spinal tubercles on tergite VIII; the marginal tubercles elevated, on pronotum to 0.030 mm in diameter, elsewhere smaller. Dorsal hairs not numerous, about 10—14 on each of abd. tergites I—II, inverted bottle-shaped, on tergites I—III about 0.008 mm long, the 4 hairs on tergite VIII about 0.016—0.020 mm long. Frontal tubercles rather low, much diverging, quite smooth, with 4—6 hairs each; median process hardly developed. Antennae much shorter than body, pale, very gradually darker to the brown processus terminalis, without noticeably darker tips to the segments; flagellum gradually more distinctly imbricated from base of segment III to apex; rhinaria on segment III rather small and inconspicuous, not elevated or protruding, rather far apart up to nearly halfway the segment; segment III with 22—24 very inconspicuous hairs of 0.006—0.008 mm long, 1/6—1/4 of basal diameter of the segment; processus terminalis short, with one hair besides the apical ones. Rostrum just reaching the middle coxae; last segment 0.10 mm long, about 5/7 of second joint of hind tarsi, with 9 hairs besides the 3 subapical pairs. Legs pigmented like the antennae, apices of tibiae slightly darker, tarsi dark brown; femora ventrally with many small scales towards apex; first tarsal joints with 5,5,5 or 5,5,4 hairs, the median one half as long as the others; second tarsal joints imbricated, with about 4 pairs of ventral hairs. Siphunculi cylindrical with wide base, pale without darker apex, gradually more distinctly imbricated from base to apex, halfway about as thick as middle portion of hind tibiae; apical part missing. Cauda elongated triangular with a very faint constriction, pale, with 8 hairs of which only the most basal ones are acute, the others stunted and partly very short (e.g., 0.013 mm). Subgenital plate with 8 hairs near posterior margin, 2 hairs on anterior half.

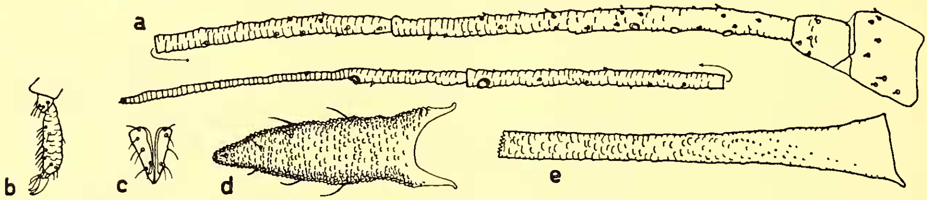

Fig. 1. *Acyrthosiphon pentatrichopus* spec. nov. Fundatrix: a, antenna; b, hind tarsus; c, last rostral segment; d, cauda; e, siphunculus with probably broken apex. All × 72

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Siph.	Cau.	Rhin. on III
1	3.20	2.49	0.75	0.43	0.47	0.21 + 0.41	0.72	0.44	1 & 3

(from *Rosa fendleri,* Helper, Utah, U.S.A., 17.V.'58, leg. G. F. Knowlton).

Apterous viviparous female.

In mounted specimens body slenderly spindle-shaped. Rather like fundatrix, but tergum much thinner, indistinctly wrinkled, not reticulated. Spinal and marginal tubercles distinct, but slightly flatter. Dorsal hairs about 1½—2 times as long as in fundatrix, tergite VIII with 5—8 hairs. Frontal tubercles better developed. Antennae much longer than body, and segments of flagellum with faintly darker tips; segment III with 3—12 rhinaria irregularly spaced in mostly single file over basal 1/3—6/11 part of segment. Last rostral segment 0.105—0.11 mm, only about 5/9 of second joint of hind tarsi, with 9—11 hairs besides the 3 subapical pairs. Legs much longer; second tarsal joints ventrally with several more hairs. Siphunculi about 2/7—1/3 of length of body, about as long as ant. segment III, with small flange. Cauda less than half as long as siphunculi, more acute and not or hardly constricted, with 7—9 hairs of which the 3—5 stunted dorso-apical hairs are longer. Otherwise as in fundatrix.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Rhin. on III	Siph.	Cau.
1	3.29	3.86	0.95	0.77	0.67	0.20 + 1.03	7 & 8	1.02	0.43
2	3.11	3.97	0.97	0.74	0.71	0.20 + 1.10	4 & 5	0.95	0.41
3	2.99	4.16	0.99	0.78	0.75	0.20 + 1.18	3 & 5	0.99	0.43
4	3.36	3.98	1.04	0.79	0.74	0.18 + 1.00	5 & 5	1.01	0.44

(1—4, from *Rosa* sp., Mud Springs, Colorado, U.S.A., 9.VII.'66, leg. F. C. Hottes & H. L. G. Stroyan no. U.S.A. 281).

Discussion. The first available specimen, a fundatrix, rather strongly resembles fundatrices of *Acyrthosiphon wasintae* (Hottes) as to general shape, length of processus terminalis, etc., but it differs by the chaetotaxy of the first tarsal joints, the length and chaetotaxy of the last rostral segment, the caudal hairs, etc. It is very surprising that Palmer (1952, p. 330, fig. 396) draws the processus terminalis of the male of *A. wasintae* as in the fundatrix of our new species, but writes that it is 0.90 mm long. It is clear that our first *A. pentatrichopus* is a fundatrix, because an embryo inside has a comparatively very much longer processus terminalis. Dr. Stroyan kindly allowed me to add a description of his material, which consisted of apterous viviparae of probably the third generation.

The species can be separated from all known species of *Acyrthosiphon* by the combination of its first tarsal chaetotaxy with siphunculi twice or more times as long as the cauda. In the number of hairs on the first tarsal joints the aphid agrees with *Acyrthosiphon cyparissiae* (Koch), but that species has short siphunculi.

Types. Holotype: fundatrix, from *Rosa fendleri*, Helper, Utah, U.S.A., 17.V.'58, leg. G. F. Knowlton, in the author's collection. Paratypes: apterous viviparous female, from *Rosa* sp., Mud Springs, Colorado, U.S.A., 9.VII.'66, leg. F. C. Hottes & H. L. G. Stroyan no. U.S.A. 281, in the collection of Dr. Stroyan, Harpenden, Herts.

Acyrthosiphon vandenboschi spec. nov.

Apterous viviparous female.

Colour in life not known. In mounted specimens body elongate spindle-shaped, 3.75—4.35 mm long. Tergum membranous, smooth. No marginal or spinal tubercles present. Dorsal hairs stiff, rather thick, blunt or with faintly incrassate, colourless apices, the longest spinal and marginal ones on tergite III 0.052 mm long, the shortest 0.026 mm; tergites I—III each with about 14—20 hairs of which 6—12 are marginal ones; tergite VIII with 10—12 hairs of which the longest are 0.055 mm long. Frontal tubercles large, diverging, quite smooth, with 8—10 hairs of about 0.050 mm long; median process hardly developed. Antennae about 1 1/5 times as long as body, pale, with the very tips of segment III, IV and V, and the part around the rhinaria on VI dark brown; flagellum, except the very base of segment III, evenly and lightly imbricated; segment I with 11—14 hairs; segment III without rhinaria, with some 30 rather spreading, stiff hairs of up to 0.035 mm long, i.e., about 2/3 of basal diameter of segment; processus terminalis with about 10—19 small hairs besides those at apex. Last rostral segment about 0.22—0.25 mm long, 1 1/2—1 4/7 times as long as second joint of hind tarsi, not pointed, with about 40 hairs besides the 3 subapical pairs. Legs long, pale, with only the apices of the tibiae brown, and the tarsi blackish brown, with rather spiny hairs, the femora very slightly imbricated; first tarsal joints with 3, 3, 3 spiny hairs of similar shape, the middle one little shorter than the others; second tarsal joints slightly imbricated, with numerous ventral hairs. Stigmal pori oval, not or only very faintly reniform, about 0.026 × 0.016 mm. Siphunculi pale with the very apices brown, evenly, basad almost denticulately imbricated from base to apex, nearly cylindrical with widened base, very slender, at mid-length thinner than middle portion of hind tibiae, very long, about 2/7—3/8 of length of body, without a trace of reticulation below the well developed, thin, flange. Cauda pale, not constricted, with almost cylindrical basal half, and evenly tapering distal half, just not acute, 3/8—2/5 of the siphunculi, with 16—19 subacute to acute hairs. Subgenital plate with 12—16 hairs along posterior margin and 2—4 on anterior half.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Siph.	Cau.
1	3.84	4.53	0.98	0.85	0.75	0.18 + 1.46	1.36	0.52
2	4.04	—	1.04	0.91	0.75	0.17 + ?	1.25	0.48
3	4.35	—	1.04	0.96	0.80	0.19 + ?	1.43	0.52
4	4.34	4.75	1.12	0.93	0.70	0.17 + 1.48	1.36	0.49
5	4.28	4.52	1.07	0.83	0.75	0.18 + 1.36	1.38	0.48
6	4.36	4.77	1.08	0.98	0.76	0.20 + 1.39	1.46	0.51

(1—6, from *Potentilla glandulosa,* Willow Creek (Monterey Co.), California, U.S.A., 4.IV.'66, leg. R. van den Bosch no. 66-IV-4i and 66-IV-4m).

Alate viviparous female.

Colour in life unknown. Mounted specimens with faintly brownish yellow head, fuscous around the ocelli, similarly pale mesothorax, minute pale brownish marginal sclerites on abdomen. Shape similar to apterous viviparous female. Antennae 1¼ times as long as body; basal segments brown, very base of segment III almost colourless but rest of segment black, the other segments from rather dark brown to blackish, but paler than segment III; segment III from base to near apex with about 42—60 small to medium-sized, hardly elevated or protruding, broad-rimmed rhinaria scattered over half the circumference. Femora brownish yellow, blackish brown dorsally near apex; tibiae with middle portion brownish yellow, at the very base pale, in between mottled dark brown, apically black like the small tarsi. Wings with dark, blackish brown, very faintly bordered veins; stigma pale smoky with dark posterior border. Marginal sclerites each with some 6—10 closely packed nodules. Siphunculi at apex just wider than near middle, with pale bases, blackish brown basal 1/2—2/3 part and similar apex, but between the dark apex and the lower portion mostly paler and more transparent. Cauda elongated triangular, dusky. Subgenital plate very slightly pigmented. Other characters very much like those in apterous viviparous female.

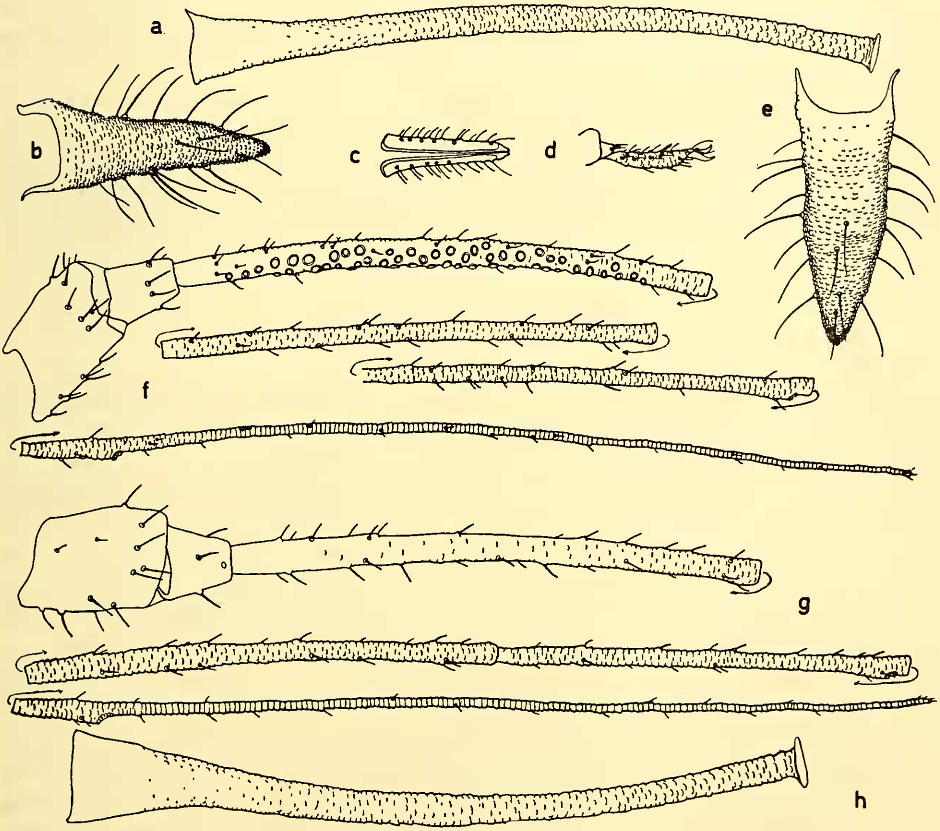

Fig. 2. *Acyrthosiphon vandenboschi* spec. nov. Al. viv. fem: a, siphunculus; b, cauda; c, last rostral segment; d, hind tarsus; f, antenna. Apt. viv. fem.; e, cauda; g, antenna; h, siphunculus. All × 72

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Rhin. on III	Siph.	Cau.
1	3.78	4.76	0.99	0.93	0.82	0.19 + 1.45	51 & 54	1.34	0.47
2	4.00	5.08	1.02	0.99	0.86	0.19 + 1.61	53 & 56	1.47	0.49
3	4.03	5.02	1.03	0.98	0.82	0.20 + 1.57	47 & ?	1.47	0.50
4	3.74	4.62	0.95	0.90	0.77	0.18 + 1.52	48 & 53	1.32	0.43
5	3.96	4.86	1.03	0.95	0.83	0.18 + 1.52	52 & 60	1.40	0.49
6	3.88	4.89	1.09	0.91	0.79	0.19 + 1.56	42 & 50	1.32	0.53

(1—6, with apterous viviparous females no. 1—3).

Discussion. This species with its very long and slender siphunculi immediately reminds one of *A. macrosiphum* (Wilson) and *A. gossypii* Mordv., but it is at once distinguished by the very hairy last rostral segment, and by the absence of secondary rhinaria in apterae viviparae.

The species is named for my friend and colleague Dr. R. van den Bosch, of the University of California, Berkeley, who in his hunt for aphid parasites produces a steady stream of unknown aphids.

Types. Holotype: apterous viviparous female (no. 1 of measurements) from *Potentilla glandulosa,* Willow Creek (Highway no. 1, Monterey Co.), California, U.S.A., 4.IV.'66, leg. R. van den Bosch no. 66-IV-4i. In the authors collection. Paratypes: apterous and alate viviparous female with collecting data as for holotype, in the collections of the Biol. Control Dept., Univ. of California, Berkeley, and in the author's collection.

Aphis agastachyos spec. nov.

Apterous viviparous female.

Colour in life dark green (Stroyan). In mounted specimens either quite pale or, in slightly alatiform apterae, head infuscated, siphunculi gradually darker towards apex, cauda quite dark like the apices of tibiae and the tarsi. Body about 1.50—2.00 mm long, broadly oval, with only on the mesothoracic pleura and caudad each siphunculus more or less pigmented sclerites. Tergum often distinctly reticulated. Dorsal hairs variable in number, often pleural or duplicated spinal hairs present; hairs stiff, with fine, not flexuose apices, long, on tergite III spinally up to 0.055 mm long; tergite VIII with 4—8, mostly 6, hairs of similar shape up to 0.070 mm long. Marginal tubercles only on abdominal tergites I and VII, bluntly conical, about as tall as their basal width (e.g., 0.020—0.030 mm). Front not much sinuated, with the hairs as long as, but stouter than hairs more ventrally. Antennae evenly pale or with darker apices, 1/2—5/9 of length of body; flagellum ventrally markedly imbricated from the very base of segment III, but segment III dorsally nearly smooth, in true apterae without rhinaria or in specimens with dark head with 1—5 small rhinaria; processus terminalis 1 1/2—1 4/5 times as long as base of segment VI, mostly somewhat bent near the primary rhinaria; hairs on segment III stiff, variable, from blunt with faintly incrassate apices, to very acute, the longest about 1 1/2—2 times as long as basal diameter of the segment. Rostrum when extended reaching a little past middle coxae; last segment about 0.105—0.125 mm long, about

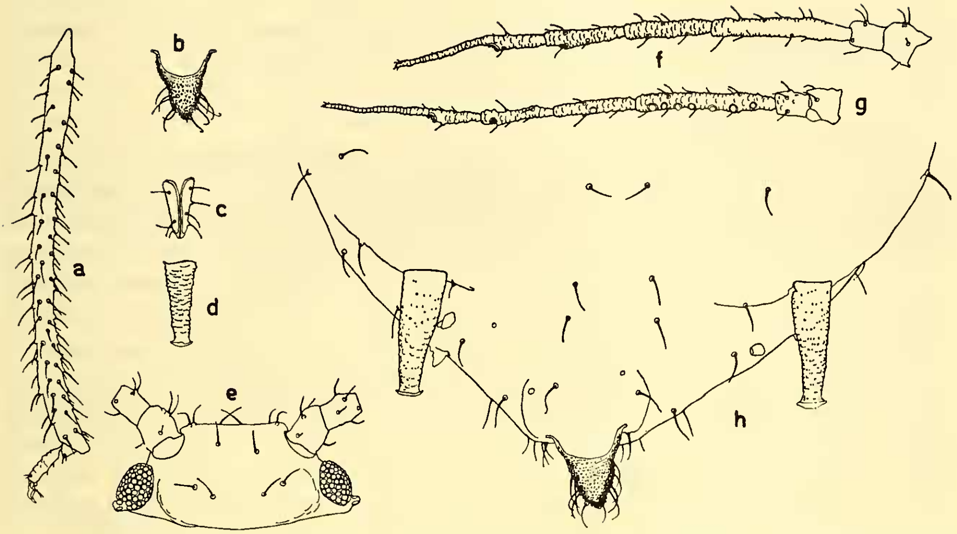

Fig. 3. *Aphis agastachyos* spec. nov. Apt. viv. fem.: a, tibia + hind tarsus; c, last rostral segment; e, head; f, antenna; h, posterior part of abdomen. Al. viv. fem.: b, cauda; d, siphunculus; g, antenna. All × 72

1¼ times the very small second joints of hind tarsi, with 4—8 hairs besides the 3 subapical pairs. Legs pale, or, in specimens with pigmented head, with dark apices to the tibiae; longest ventral femoral hair 0.060—0.075 mm long; dorsal hairs halfway hind tibia spreading and longer than local diameter of tibia; tarsi small, second joint twice apical diameter of hind tibia. Siphunculi pale or in alatiforms infuscated towards apex, rather thick, evenly tapering to near apex, or there just perceptibly constricted, about 1/9—1/7 of length of body, imbricated but apical 1/5—1/4 part at least dorsally nearly smooth, with a very wide (for an *Aphis*) flange, about 1 1/3 times as wide as the part just basad. Cauda thick, more or less bluntly triangular, about as long as its basal width, darker than siphunculi and 1/2—2/3 of their length, with 7—12 acute, strongly curved hairs, some of which are placed dorso-apically. Subgenital plate with 10—12 hairs along posterior margin and 6—10 on anterior half.

Measurements in mm.

No.	Length body	Ant.	Ant. segments				Siph.	Cau.
			III	IV	V	VI		
1	1.54	0.83	0.21	0.12	0.12	0.10 + 0.17	0.15	0.11
2	1.97	0.99	0.28	0.15	0.15	0.11 + 0.18	0.22	0.15
3	1.96	1.03	0.26	0.15	0.16	0.13 + 0.20	0.23	0.15
4	1.80	0.94	0.27	0.14	0.14	0.10 + 0.18	0.19	0.13
5	1.81	1.04	0.26	0.16	0.16	0.12 + 0.21	0.22	0.16
6	1.87	1.02	0.27	0.14	0.15	0.13 + 0.21	0.22	0.15
7	1.51	0.84	0.20	0.12	0.13	0.11 + 0.17	0.17	0.15

(All from *Agastache urticifolia*, U.S.A.; 1—2, 5—6, Cub River Canyon Idaho, 13.VIII.

'65, leg. G. F. Knowlton; 3, Monte Christo, Utah, 7.VII.'66, leg. H. L. G. Stroyan; 4, Wellsville Mountains, Utah, 15.VII.'65, leg. G. F. Knowlton; 7, Logan Canyon, Utah, 20.VII.'71, leg. G. F. Knowlton).

Alate viviparous female.

Colour. Head, thorax, siphunculi, cauda, antennae, large marginal sclerites dark to blackish, rest as in apterae. In mounted specimens body 1.60—1.90 mm long, with blackish head and thorax; large marginal and postsiphuncular sclerites, long bars across tergites VII and VIII, a broad spinal sclerite on tergite VI and often small, paired spinal sclerites on tergite V darkish. Antennae dark with the very base of segment III pale, 4/7—3/5 of length of body; segment III with 7—16 very unequally-sized, faintly protruding rhinaria irregularly arranged along one side; segment IV with 1—4 rhinaria; segment V sometimes with a secondary rhinarium; processus terminalis at most twice as long as base of segment VI. Legs faintly brownish to brown with femora distad, and tibiae apically blackish. Venation normal, greyish brown, not bordered. Siphunculi blackish, cylindrical to slightly tapering, with the large flange to 1½ times as wide as the smooth part just below. Cauda narrower than in apterae, with the "hard portion" less than half the total length, with up to 14 hairs. Tergite VIII with 4—8 hairs.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Siph.	Cau.	Rhin. on III	IV
1	1.77	0.94	0.24	0.15	0.14	0.11+0.19	0.15	0.13	7 & 8	1 & 2
2	1.63	0.92	0.24	0.13	0.14	0.11+0.19	0.14	0.12	10 & 11	2 & 2
3	1.84	1.01	0.27	0.15	0.16	0.11+0.20	0.18	0.13	10 & 13	3 & 1
4	1.66	0.90	0.26	0.13	0.13	0.10+0.18	0.14	0.12	9 & 11	4 & 2
5	1.78	0.93	0.24	0.14	0.14	0.10+0.19	0.17	0.13	9 & 12	3 & 4
6	1.72	0.97	0.26	0.15	0.14	0.11+0.20	0.15	0.12	14 & 9	1 & 2

(1—2, with apt. viv. 1—2; 3, with apt. viv. 3; 4—6, with apt. viv. 4—6).

Oviparous female.

Colour in life not known. In mounted specimens much like apterous viviparous female, but body more slender. Antennae with 5 or 6 segments. Abdominal tergite VIII with 16—20 hairs. Hind tibiae not or hardly incrassate, with 3—12 pseudosensoria, pigmented like other tibiae. Siphunculi pale with infuscated apex, flange smaller than in apterae viviparae. Cauda bluntly conical, with 12—14 hairs. Subgenital plate with middle 1/3 part unpigmented, rather evenly hairy.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Siph.	Cau.
1	1.52	0.69	0.14	0.10	0.12	0.10+0.15	0.14	0.13
2	1.36	0.57	0.17	0.10	0.06+0.16		0.11	0.10
3	1.39	0.58	0.17	0.10	0.07+0.15		0.11	0.11

(1, with apt. viv. fem. no. 3; 2—3, with apt. viv. fem. no. 7).

Apterous male.

Colour in life not known. In mounted specimens head and part of the pro- and mesothorax as well as marginal sclerites, small sclerites on which the spinal hairs from mesonotum to abd. tergite VI are placed, small postsiphuncular sclerites, and bars across tergites VII and VIII dark sclerotic. Antennae dark like head, rather thick, with conspicuously imbricated flagellum; rhinaria flat, small, over nearly half the circumference of segments III—V; hairs on segment III over twice as long as diameter of segment at its constricted base. Siphunculi dark with the very base pale, slightly tapering, imbricated, with normal flange. Cauda dark, small, slightly constricted, with 6 hairs. Remainder more or less as is apt. viv. fem.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Rhin. on segment III	IV	V	Siph.	Cau.
1	1.35	0.72	0.17	0.12	0.11	0.07+0.14	12&14	7&8	4&4	0.09	0.09

(1, with apt. viv. fem. no. 7).

Discussion. This species seems to curl the leaves of *Agastache urticifolia.* Several samples were received from Dr. G. F. Knowlton, and seven slides from Dr. H. L. G. Stroyan, who provided his colour notes.

The aphid was first identified as *Aphis ramona* Swain, known from *Salvia mellifera* (syn. *Ramona stachyoides*) from California. But *A. ramona* differs by having all the antennal and dorsal hairs blunt and shorter; by having in apterae viviparae 2, rarely 3 hairs on abdominal tergite VIII; and by the flange of the siphunculi being much narrower, about 1 1/5—1 2/9 times as wide as the smooth part basad in apterae viviparae, about 1 1/3 times as wide as the thinnest part basad in alatae. Sensoriation of antennae, rostrum, tarsi, etc., are very much the same, but the cauda has fewer hairs and the subgenital plate has mostly 2 hairs on anterior half.

Because of the several hairs on the basal half of the last rostral segment, the pale siphunculi and mostly darker cauda in apterae viviparae, and the sensoriation of the alatae, *Aphis ramona* Swain and *A. agastachyos* spec. nov. strongly resemble the *Aphis oenotherae* group of *Aphis* (*A. oenotherae* Oestl., *A. neomexicana* Cock., *A. sanborni* Patch, *A. varians* Patch, etc.). They differ from this group by the conspicuous flange to the siphunculi.

The occurrence of sexuals in early summer is rare in aphids and exceptional in *Aphis* L. The oviparous females contained no eggs, and therefore perhaps later the production of oviparae might be larger. On the other hand it is possible that eggs are laid very early, and that may be a reason why this conspicuous species was not found by the specialists working over Utah and Idaho.

Types. Holotype: apterous viviparous female (measurements no. 1), from *Agastache urticifolia,* Cub River Canyon, Idaho, U.S.A., 13.VII.'65, leg. G. F. Knowlton, Paratypes: apterous and alate viviparae with data as for holotype, and all others mentioned under the measurements.

Aphis astragalina spec. nov.

Apterous viviparous female.

Colour in life not known. In mounted specimens body broadly oval, about 2.50 mm long. Sclerotisation of dorsum variable, from largely membranous with scattered spinal sclerites, a broken, very irregular spino-pleural bar on tergite IV, a broad, very irregular and perforated, thick spino-pleural bar across tergite V partly fused with a more regular, longer bar across tergite VI, to almost completely fused thick spino-pleural bars across tergites I—IV with the sclerotic bar across tergite IV solidly fused with that across V and partly with that across VI; marginal sclerites small or large, free; tergites VII and VIII with free bars, the one on VIII encircling the segment to nearly the subgenital plate; tergum cephalad siphunculi also on the membranous parts distinctly reticulated (Montana specimens) or not. Dorsal hairs scarce, spinally on tergite III 0.035—0.052 mm long, the 12 hairs on the sclerite on tergite VIII to 0.065 mm long. Marginal tubercles on tergites I and VII, bluntly conical to cylindrical with rounded tops, on tergite VII more or less distinctly complex, with a basal diameter of 0.030—0.035 mm. Head blackish; front sinuate; frontal hairs long and fine, to 0.060 mm long, dorsal cephalic hairs from 0.040—0.060 mm long. Antennae about 4/7 length of body, with blackish basal segments, remainder pale with brownish apices to segments (III), IV and V; VI brown; segment III without scaliness on one side, along the other side markedly im-

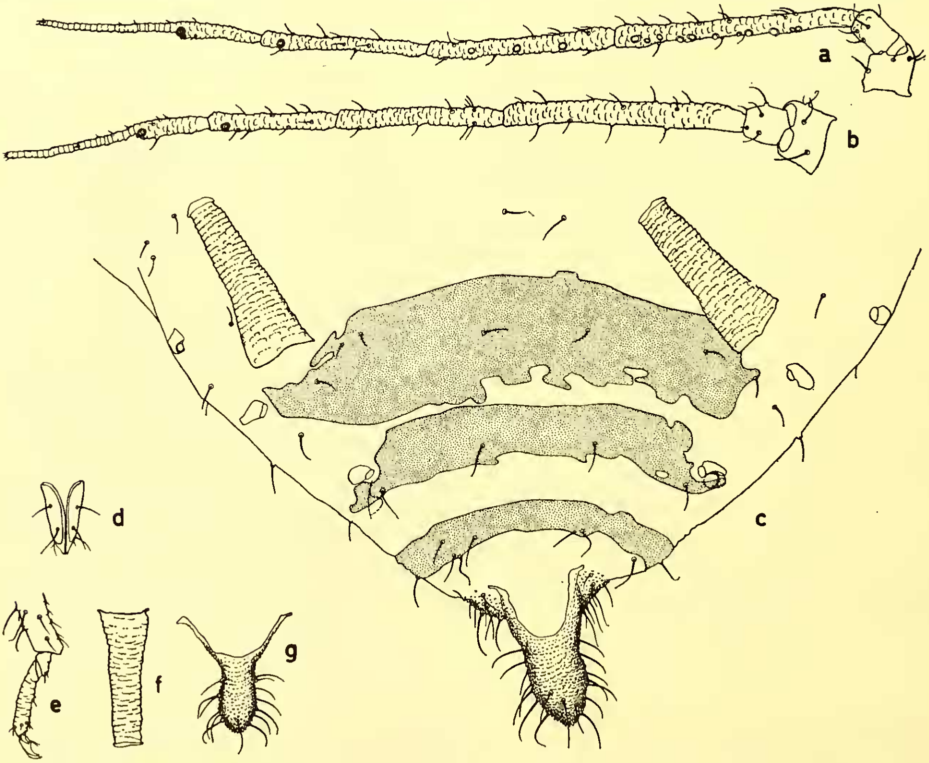

Fig. 4. *Aphis astragalina* spec. nov. Apt. viv. fem.: b, antenna; c, abdomen; d, last rostral segment; e, tip tibia + hind tarsus. Al. viv. fem.: a, antenna; f, siphunculus; g, cauda. All × 72

bricated; processus terminalis short, 1½ times base of segment VI; hairs on segment III rather numerous (8—12), spreading to erect, up to 0.052 mm long, to twice diameter of segment at its constricted base; segment VI on base with 2—3 hairs of 0.025—0.035 mm, but besides with 1—3 short (0.0085 mm) spiny hairs similar to the 3—4 occurring on basal 2/3 part of the processus terminalis which besides has 4 on the top. Rostrum reaching to middle coxae; last segment rather blunt, 0.12—0.13 mm long, 4/5—1 times as long as second joint of hind tarsi, with 2 hairs besides the 3 subapical pairs. Legs rather short and thick; femora blackish brown with pale base; tibiae pale with the very base infuscated and distal 1/4—1/3 blackish brown, conspicuously tapering from near base to apex; femoral hairs fine, longest ventral one up to 0.070 mm; tibial hairs dorsally fine and erect, to 0.065 mm long, halfway tibiae just shorter than local diameter of tibia, but ventral hairs more spiny and on basal part some only 0.022 mm long; first tarsal joints with 3, 3, 2 hairs; second joints with distal dorsal pair not longer than middle dorsal pair of fore and mid legs. Siphunculi black, thick, tapering, 1/9—1/8 of length of body, strongly but rather bluntly imbricated, with just indicated flange. Cauda black, thick, fingertip-shaped with a faint constriction, just shorter than siphunculi, with 17 normal, long, curved hairs. Subgenital plate with 10—12 long hairs on anterior half.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Siph.	Cau.
1	2.40	1.28	0.36	0.23	0.20	0.13 + 0.19	0.28	0.26
2	2.52	1.44	0.42	0.28	0.24	0.14 + 0.21	0.30	0.27

(1, from white flowered Leguminosa, 4 mi. E. of Elliston, Montana, U.S.A., 20.VII.'66, leg. F.G.A.—A.P.G. no. G66—VII—20f; 2, from *Astragalus,* 2 mi. E. of Conmore, Alberta, Canada, 17.VII.'66, leg. F.G.A.—A.P.G. no. F66—7—17h).

Alate viviparous female.

Colour in life not known. In mounted specimens head and thorax black sclerotic, abdomen on tergites I—IV with scattered, transverse spinal and pleural sclerites, and with very large marginal sclerites; on tergite V with an irregular transverse bar, on tergites VI—VIII with bars as in apterae. Hairs shaped as in apterae, but tergite VIII with 8 hairs though in view of the irregular arrangement other numbers probably occur. Antennae with black basal segments, flagellum with the very base pale, rest brown, very gradually blackish brown towards apex; segment III with the rhinaria very unequal in size, more or less in a line; the rhinaria evenly spaced over length of segment IV; hairs on segment III shorter, to 0.030 mm, but on segment VI as in apterae. Wings probably with normal venation (damaged), veins brownish grey, not bordered. Siphunculi thinner and less tapering. Cauda with triangular base and cylindrical or even very elongate oval distal half, very blunt, with 14 hairs. Other characters as in apterae.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Rhin. on III	IV	Siph.	Cau.
1	2.48	1.61	0.44	0.34	0.30	0.15+0.22	11 & ?	3 & ?	0.23	0.20

(1, with aptera no. 1).

Discussion. Few *Aphis* spp. have been described from North America after they were cleared, and therefore it is not possible to discover from published descriptions what kind of sclerotisation occurs in apterae viviparae of Nearctic *Aphis*. There appears to be a small group of Nearctic species that are comparable to the *craccivora* group of *Aphis*, originally Palaearctic. The Nearctic ones I saw, differ by three characters: the presence of a sclerotic band encircling abd. segment VIII to near the subgenital plate, and bearing some 3—12 hairs, marginal tubercles on abdomen with a rather wide sclerotic basal part, and a rather high number of spiny hairs on the processus terminalis and often the basal part of antennal segment VI. In this sense also *Aphis lupini* Gill. & Palmer, according to a specimen identified by Prof. Palmer that I remounted, without a sclerotic dorsum, comes near this group. None of the species so far known to me has such long antennal hairs as *A. astragalina* spec. nov., or so many caudal hairs.

Types. Holotype: Apterous viviparous female (no. 1 of measurements), from white flowered Leguminosa, 4 mi. E. of Elliston, Montana, U.S.A., 20.VII.'66, leg. F.G.A. —A.P.G. no. G 66—VII—20 f. Paratypes: one alate vivipara with collecting data as for holotype, and one aptera vivipara from *Astragalus* sp., 2 mi. E. of Conmore, Alberta, Canada, 17.VII.'66, leg. F.G.A.—A.P.G. no. F66—VII—17h.

Aphis atromaculata spec. nov.

Apterous viviparous female.

Colour in life not known. In mounted specimens body about 2.10—2.40 mm long, very broadly oval. Head and thorax black sclerotic; over abd. tergites I—VII thick, nearly solid, black sclerotic bars, often more or less completely fused on tergites II—VI, the bars on tergites I, VII and VIII always free; sclerotisation laterally reaching to near the stigmata, and rather distinctly reticulated. Tall (to 0.045 mm), large (basal diameter 0.035 mm), often constricted, on the basal portion sclerotic, marginal tubercles on abd. tergites I and VII, in one out of 11 specimens with a smaller one on tergite II. Dorsal hairs scarce, rather stiff, pointed, on abd. tergites I—II spinally about 0.035—0.045 mm long, the 3—6 hairs on tergite VIII with fine apices, to 0.070 mm long. Front slightly sinuated, antennae about 4/7—2/3 of length of body; basal segments black, segments III and IV pale with brown apices, V and VI dark brown; segment III from base imbricated by smallish scales, without rhinaria, processus terminalis 1 1/2—1 2/3 times base of last segment, with 1—2 small spines like the 4 on apex; hairs on flagellum rather acute and spreading, longest ones on segment III to 0.035—0.040 mm and slightly longer than diameter of segment at its slightly constricted base. Rostrum according to stylet length reaching to hind coxae; last segment about 0.14—0.15 mm long, normal, with 2 hairs besides the 3 pairs near apex. Mid and hind femora blackish with only the very bases pale, fore femora paler; all femoral hairs except some dorso-apical ones long and fine, largest ventral hair 0.050—0.060 mm long; tibiae brownish yellow with the very apex, and distal 1/4—1/3 part blackish; dorsal tibial hairs, excepting 1—4 blunt ones near base, long and fine, spreading, on basal half to 0.055 mm long, not quite as long as local diameter of tibia; first tarsal joints with 3, 3, 3, or (perhaps) sometimes 3, 3, 2 hairs; second joints about 0.10 mm long, only 1½ times as long as apical diameter of tibiae. Siphunculi quite black, more or less cylindrical with widened base, 1/7—1/6 of length of body, evenly imbricated, with very small flange. Tergite VIII with a long blackish sclerotic bar reaching nearly to the subgenital plate. Cauda black, rather thick,

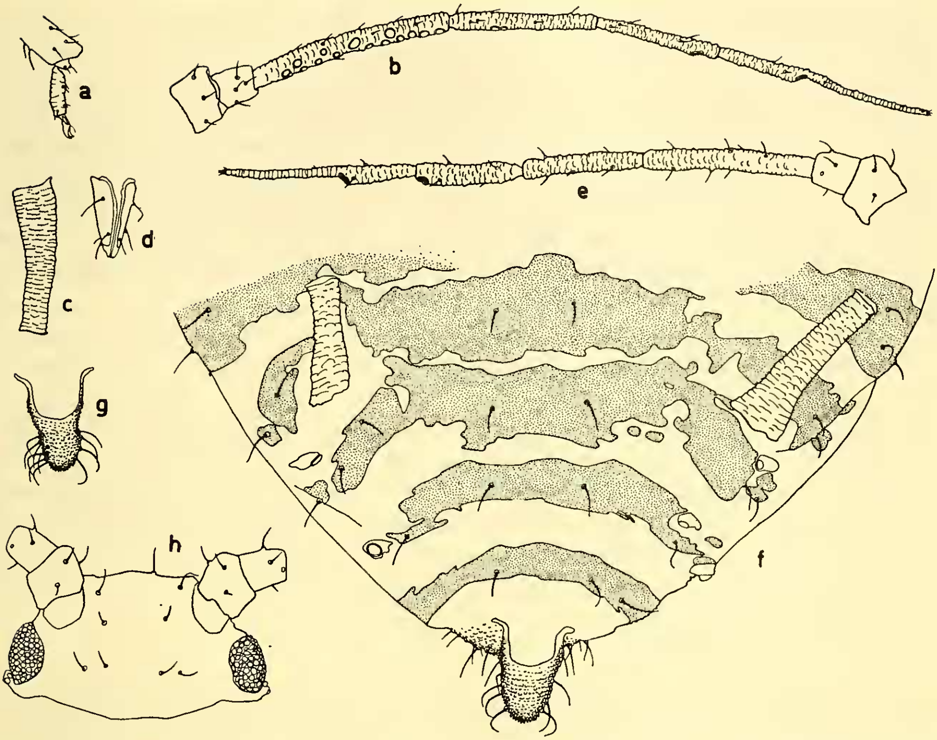

Fig. 5. *Aphis atromaculata* spec. nov. Apt. viv. fem.: a, tip tibia + hind tarsus; d, last rostral segment; e, antenna; f, posterior part of abdomen; h, head. Al. viv. fem.: b, antenna; c, siphunculus; g, cauda. All × 72

fingertip-shaped, perhaps sometimes constricted, 2/5—3/5 of length of siphunculi, with 7—9 almost hooked hairs. Subgenital plate with 5—9 hairs on disc and anterior half.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Siph.	Cau.
1	2.15	1.22	0.32	0.21	0.19	0.14 + 0.21	0.30	0.18
2	2.14	1.28	0.35	0.21	0.21	0.14 + 0.21	0.38	0.18
3	2.28	1.28	0.36	0.22	0.22	0.13 + 0.19	0.36	0.19
4	2.36	1.54	0.45	0.30	0.24	0.15 + 0.24	0.33	0.18

(1—4, "*Ribes* or?", Zigzag, Oregon, U.S.A., 28.VI.'57, leg. G. F. Knowlton & D. W. Davis).

Alate viviparous female.

Colour in life not known. In mounted specimens body 2.05—2.45 mm long. Head and thorax black sclerotic; abdomen on all tergites with completely free, blackish, spino-pleural transverse bars sometimes fused with intersegmental sclerites but not with the conspicuous marginal sclerites. Antennae black with only the very base of segment III brown; segment III with 22—29 medium-sized, nearly flat, not bulging, scattered rhinaria; segment IV with 0—4 inconspicuous rhinaria in file; segment V only on one antenna (with 4 rhinaria on IV) with a secondary rhinarium; processus terminalis as in apterae 1 1/2—1 2/3 times as long as base of segment VI. Wings with normal venation, veins rather dark brown, stigma about as dark as dorsal abdominal sclerites, darker than subcosta. Tibiae with more black at base and apex, in old specimens nearly wholly dark; dorsal tibial hairs more adpressed than in apterae, shorter, and a larger basal portion with blunt hairs. Siphunculi rather shorter than in apterae. Cauda distinctly constricted, with 8—12 hairs. Other characters rather as in apterae.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Rhin. on III	IV	Siph.	Cau.
1	2.36	1.40	0.37	0.26	0.22	0.16+0.23	25 & 26	1 & 2	0.27	0.18
2	2.31	1.43	0.38	0.24	0.23	0.16+0.26	23 & 27	3 & 0	0.27	0.16
3	2.11	1.37	0.37	0.23	0.22	0.15+0.25	22 & 22	3 & 3	0.28	0.17
4	2.21	1.34	0.35	0.22	0.22	0.15+0.25	24 & 29	1 & 1	0.27	0.18

(1—4, with the preceding morph).

Discussion. This *Aphis* belongs morphologically to the long-haired section of the *Aphis craccivora* Koch group, which has very few members in Europe, all on Leguminosae. In America, native long-haired *Aphis* with extensive black abdominal sclerotisation so far are known from only one Leguminosa, *Astragalus* spp. *Aphis cercocarpi* Gill. & Palmer from *Cercocarpus* spp. seems to be the only earlier described species. It can easily be recognized by the absence of rhinaria on ant. segment IV in alatae, by the shape of its cauda, and the pigmentation of the antennae. Apterae have scattered areas of sclerotisation on the abdomen, as specimens remounted from slides received from Professor Palmer showed. The present species can easily be distinguished from *astragalina* by the much larger number of rhinaria in alatae, and the shorter tarsi in all known morphs. Similar *Aphis* species from *Spiraea,* as yet undescribed, has (or have) also longer tarsi. The South American *A. mulini*, described on p. 121 of this paper, differs by possessing marginal tubercles also on abd. segments II—IV, while in the other American species they are only present on segments I and VII.

Unfortunately the host plant is not known, but the species can so easily be recognized that I venture to describe it from the sample. *Ribes* is the most unlikely host plant.

Types. Holotype: apterous viviparous female (no. 1 of measurements), from "*Ribes* or ?", Zigzag, Oregon, U.S.A., 28.VI.'57, leg. G. F. Knowlton & D. W. Davis no. 367. Paratypes: the measured apterae viviparae and 7 alatae viviparae.

Aphis baccharicola spec. nov.

Apterous viviparous female.

Colour in life not known. In mounted specimens head and parts of thorax quite dark to blackish; abdomen with rather short spinal to spino-pleural dark sclerotic bars across tergites VII and VIII, and often a short, thicker spinal sclerite on tergite VI; small marginal sclerites and large post-siphuncular sclerites on tergites I—VI but these paler than the blackish intersegmental sclerites; sometimes small fragments of spinal sclerites on more anterior tergites. Tergum more or less distinctly reticulated. Dorsal hairs sparse, fine, with wavy apices, the spinal ones on abdominal tergite III about 0.050—0.060 mm long, the 2—4 hairs on tergite VIII to 0.070 mm long. Marginal tubercles on abdomen only on tergites I and VII, large, less than half as long as their basal width (e.g., 0.045—0.060 mm). Front sinuated, the frontal and dorsal hairs in length similar to the ventral ones. Antennae with basal segments slightly paler than head, flagellum pale with dark apex; length of antennae 5/8—2/3 of length of body; segment III without rhinaria, rather sharply imbricated from near base; processus terminalis 1 8/11—2 3/10 times base of segment VI, usually with 2—3 spines besides those at apex; hairs on segment III conspicuously erect, fine, the longest ones just over twice as long as diameter of the segment at its only slightly constricted base. Rostrum when extended reaching to hind coxae; last segment rather slender, 0.11—0.12 mm long, subequal to second joints of hind tarsi, with 2 long hairs besides the 3 subapical pairs. Femora blackish brown with shorter or longer pale basal part; longest ventral femoral hair about 0.060 mm; tibiae with the very base and distal 1/5 part dark brown, the rest yellowish to brownish yellow; dorsal hairs on hind tibiae spreading, all long and fine, halfway tibia about 0.060 mm long, 1 1/2—1 3/5 times as long as local diameter of tibia; hairs on ventral side of tibia more variable, all shorter, and mostly more spiny. Siphunculi black, rather thick, evenly densely imbricated, tapering to the middle with distal half cylindrical or tapering to the top, with the apex often faintly attenuated, in the middle about 1 3/8—1 1/2 times as thick as halfway diameter of hind tibiae, about 1/6—2/11 of length of body, rather often with up to 2 hairs of the type of the dorsal body hairs but shorter; flange small, about 1 1/10 times as wide as the part just basad. Cauda as dark as siphunculi, very strongly tapering on basal 1/3 part, less tapering on distal part, quite blunt, 1/2—2/3 of length of siphunculi, with 8—9 very strongly curved hairs, one of which is dorso-apical. Subgenital plate with 2 hairs on anterior half.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Siph.	Cau.
1	1.58	1.09	0.31	0.17	0.15	0.11 + 0.23	0.27	0.15
2	1.72	0.98	0.28	0.15	0.14	0.11 + 0.19	0.31	0.15
3	1.45	0.96	0.22	0.15	0.14	0.11 + 0.21	0.23	0.14
4	1.63	0.96	0.28	0.14	0.14	0.10 + 0.19	0.27	0.11
5	1.45	0.98	0.26	0.14	0.14	0.10 + 0.23	0.25	0.14
6	1.63	0.98	0.26	0.16	0.14	0.10 + 0.21	0.27	0.14
7	1.60	1.00	0.27	0.15	0.14	0.10 + 0.23	0.26	0.13

(1, from *Baccharis pilularis,* Patrick Point State Park (Humboldt Co.), California, U.S.A., 19.VIII.'66, leg. C. Lagace and D. Calvert no. G 66—VII—19 g; 2—7, from *Baccharis* sp., Clam Beach, Highway 101 (Humboldt Co.), California, U.S.A., 19.VIII. '66, leg. C. Lagace, no. L 66—VIII—19 e).

Alate viviparous female.

Colour in life not known. In mounted specimens head and thorax black, abdomen with similar sclerotic pattern as in apterae, but spinal sclerotisation much more extensive, though marginal sclerites still very little developed. Antennae blackish with base of segment III brown to pale brown, about 3/5—2/3 of length of body; segment III with about 14—22 rather equally sized, slightly protruding, rather small rhinaria along one side not in line; segment IV without rhinaria, processus terminalis to 2½ times base segment VI. Legs more slender and darker than in apterae. Venation of wings normal, with second fork of media sometimes rather near apex; veins thick and brownish, not bordered, siphunculi less thick than in apterae, with or without hairs. Cauda more evenly tapering. Tergite VIII with 3—6 hairs. Other characters as in apterae viviparae.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Siph.	Cau.	Rhin. on III
1	1.71	1.17	0.35	0.18	0.16	0.11 + 0.25	0.26	0.14	19 & 22
2	1.93	1.17	0.34	0.19	0.16	0.11 + 0.25	0.30	0.15	16 & 20
3	1.56	1.14	0.31	0.17	0.16	0.11 + 0.27	0.23	0.12	14 & 17

(1—3, with aptera no. 1; 3, intermediate with wing pads).

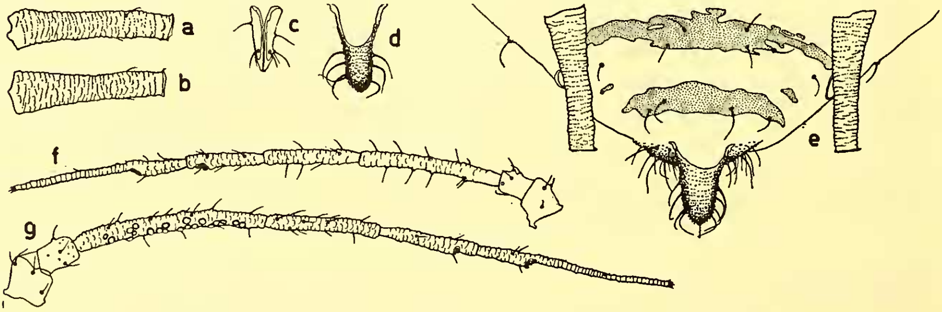

Fig. 6. *Aphis baccharicola* spec. nov. Apt. viv. fem.: a, siphunculus; c, last rostral segment; e, posterior part of abdomen; f, antenna. Al. viv. fem.: b, siphunculus; d, cauda; g, antenna. All × 72

Discussion. Every detail of the morphology of this species suggests that it belongs to the *Aphis helianthi* Monell group of the genus. Also *A. ceanothi* Clarke belongs to this group, which is characterized by a comparatively long third antennal segment with numerous irregularly arranged rhinaria in alatae, no rhinaria on segment IV, a rather short processus terminalis, moderately short antennal hairs; long and fine dorsal body hairs; thick, dark siphunculi and an almost equally dark cauda with 7—10 hairs; 2 hairs on the anterior part of the subgenital plate; on abdomen marginal tubercles only on segment I and VII; 2 hairs besides the 3 subapical pairs on the last rostral segment. Within this group *Aphis baccharicola* can immediately be recognized by its very long and fine antennal hairs, large marginal tubercles, and the not infrequent occurrence of long hairs on the siphunculi.

The new species seems to be widely spread on *Baccharis pilularis,* together with its subspec. *consanguinea* a common shrub in the California coastal area..

Types. Holotype: apterous viviparous female (without hairs on siphunculi, measurements no. 1), from *Baccharis pilularis,* Patrick Point State Park (Humboldt Co.), California, U.S.A., 19.VIII.'66, leg. C. Lagace & D. Calvert no. G 66—VIII—19 g. Paratypes: alate viviparae (with hairs on siphunculi) with collecting data as for holotype; apterae viviparae (some with hair on siphunculi), from *Baccharis* sp., Clam Beach, Highway 101 (Humboldt Co.), California, U.S.A., 19.VIII.'66, leg. C. Lagace no. L 66—VIII —19 e.

Aphis mimuli Oestlund, 1887

Apterous viviparous female.

Colour in life not known. In mounted specimens quite pale with only the apices of antennae and tibiae brown and the cauda rather dark. Body about 1.55—1.75 mm long, rather broadly oval, without sclerotic pigmented spots. Reticulation of tergum faintly visible. Dorsal hairs sparse, stiff, blunt, on abdominal tergite III spinally about 0.015 —0.026 mm long, caudad much longer, the two hairs on tergite VIII very acute and up to 0.060 mm long. Marginal tubercles only on abdominal tergites I and VII, conical, about half as long as their basal width of about 0.026 mm. Front rather sinuated, with the hairs 0.025—0.035 mm long. Antennae pale with the apex from basal one-third part of segment V more or less dark brown, 4/9—5/9 of length of body; flagellum on basal 1/3—1/2 of segment III ventrally with some small dispersed scaly imbrications, more distally strongly but not densely imbricated, without secondary rhinaria; processus terminalis 1 4/5—2 1/9 times as long as base of segment VI; segment III with about 5—8 stiff, blunt hairs, the longest of which is just shorter than basal diameter of the segment. Rostrum nearly reaching hind coxae; last segment about 0.13—0.14 mm long, with about 6—9 hairs besides the 3 subapical pairs. Legs pale with apices of tibiae brown; femora hairy, longest ventral hair about 0.025 mm long; hind tibiae with rather erect, stiff hairs with mostly spear-shaped apices, halfway the tibiae about 0.019—0.020 mm long, just shorter than local diameter of the tibia. Siphunculi pale with sometimes the apex faintly dusky, rather thick, tapering to distal one-fourth part or to apex, just attenuated, 2/15 —2/11 of length of body, on basal half almost smooth, on distal half superficially imbricated. Cauda dark, slightly constricted, with fingertip-shaped distal part, 3/5—2/3 of the siphunculi, with some 12—16 curved, normal hairs. Subgenital plate with some 16—20 hairs along posterior margin, 6—10 long hairs on anterior half.

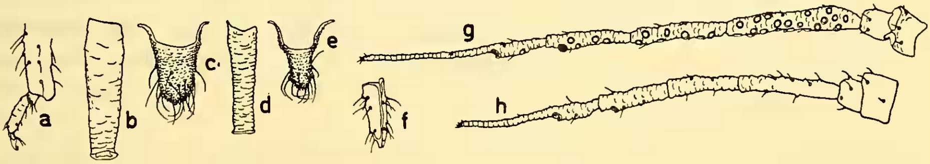

Fig. 7. *Aphis mimuli* Oestlund. Apt. viv. fem.: a, tip tibia + hind tarsus; b, siphunculus; c, cauda; h, antenna. Al. viv. fem.: d, siphunculus; e, cauda; f, last rostral segment; g, antenna. All × 72

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Siph.	Cau.
1	1.65	0.84	0.17	0.14	0.14	0.10 + 0.18	0.22	0.15
2	1.57	0.87	0.17	0.16	0.14	0.10 + 0.19	0.28	0.16
3	1.66	0.81	0.17	0.13	0.12	0.10 + 0.18	0.25	0.14
4	1.73	0.84	0.17	0.14	0.13	0.09 + 0.19	0.23	?

(1—3, from *Mimulus aurantiacus,* Union Landing (Mendocino Co.), California, U.S.A., 18.VIII.'66, leg. D. Calvert no. C 66—VIII—18 b; 4, from *Mimulus guttatus,* Plaskett Creek (Monterey Co.), California, U.S.A., 5.IV.'66, leg. R. van den Bosch no. 66—IV —5 p).

Alate viviparous female.

Coulour in life not known. In mounted specimens head and thorax black; on the abdomen rather large marginal and postsiphuncular sclerites, a thin spinal bar on tergite VIII, a thicker spinal bar on tergite VII, a very thick rectangular spinal bar on tergite VI, a complete to rudimentary spinal bar on tergite V and some small irregular sclerites on more anterior tergites dark, but paler than the conspicuous intersegmental sclerites. Antennae blackish with thick, imbricated flagellum, 5/9—3/5 of length of body; segment III up to twice as thick as its basal width, with 17—21 rather equally sized, broad-rimmed rhinaria over most of its circumference; segment IV with 7—11 rhinaria; segment V with 0—4 secondary rhinaria, and even basal part of segment VI sometimes with a secondary rhinarium; processus terminalis 2—2 1/5 times as long as base of segment VI. Legs dark, with the basal part of the femora and the larger part of the tibiae only in immature specimens pale, but then still the very base of the tibiae dark. Venation of wings normal; veins dark, rather heavy but not distinctly bordered; stigma blackish grey. Siphunculi blackish, nearly cylindrical, imbricated from near base, shorter than in apterae, with the distinct flange nearly 1 1/5 times as wide as the part just below. Cauda rather slender, dark with paler tip, with only 9—11 hairs. Anterior part of subgenital plate with (3)4—8 hairs. Other characters as in apterae.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Siph.	Cau.	Rhinaria on segments III	IV	V	VI
1	1.87	1.04	0.27	0.17	0.16	0.11+0.23	0.22	0.15	18&21	10&6	3&4	0&0
2	1.89	1.00	0.25	0.17	0.16	0.10+0.21	0.19	0.13	17&17	7&9	4&3	1&0
3	1.65	1.00	0.26	0.15	0.15	0.10+0.23	0.19	0.11	19&20	8&11	2&3	1&0
4	1.74	1.09	0.29	0.17	0.17	0.11+0.23	0.21	0.14	17&21	10&8	1&2	0&0
5	1.63	0.92	0.23	0.15	0.13	0.09+0.21	0.17	0.11	18&21	8&8	2&0	0&0

(1—5, with apterae 1—3).

Discussion. This is a typical member of the *Aphis oenotherae* group of species, which so far was only known to occur on *Ribes* spp. and on Onagraceae (*Oenothera, Epilobium, Chamaenerium*). If one sample from *Mimulus* were available, it would not have been described here, but there are two, from different species of *Mimulus*. If both apterous and alate viviparae are available, samples can be identified. Apterae look like *Aphis oenotherae* Oestl. or *A. neomexicana* Cock., but alatae have too many rhinaria. Palmer (1952) mentions 11—22 rhinaria in alate *A. oenotherae* but the high numbers almost certainly relate to *Aphis varians* Patch, which goes from *Ribes* to *Chamaenerium angustifolium,* also in Colorado. The latter species has a longer last rostral segment, more hairs on the antennae, and as a typical character 4—8 hairs on abdominal tergite VIII, besides considerably longer antennal hairs. Therefore the chaetotaxy distinguishes *Aphis mimuli* from *A. varians* Patch, the number of rhinaria separates it from the species described as *A. sanborni* Patch, *A. ribiensis* Gill. & Palmer, *A. ribigillettei* Allen & Knowlton and *A. oenotherae* Oestl.

It seemed desirable to publish a redescription of the species which was very insufficiently described in 1887 and briefly mentioned in Oestlund (1922). I did not find any further descriptive notes.

Aphis mulini spec. nov.

Apterous viviparous female.

Colour in life not known. In mounted specimens body broadly oval, about 1.75—2.00 mm long. Sclerotisation of body variable, consisting of thick, very variable, conspicuously reticulated, blackish spino-pleural transverse bars on body from metanotum to abd. tergite VIII; in very sclerotized specimens these bars tend to fuse on tergites I—V, maybe only two of them; in little sclerotized specimens the bars show perforations and a median split on tergites I—III, and as a limit are reduced to paired, very irregular and fragmented spino-pleural sclerites; marginal sclerites on abd. tergites II—IV absent, but traces present on tergite V; spino-pleural bar on tergite VIII short, thin or absent; pleural intersegmental sclerites on abdomen darker than other sclerotic parts, sharply bordered, and looking like groups of black yeast cells. Dorsal hairs on abdomen on tergites I—IV both pleurally and spinally present, but on nearly all of these tergites one or more spinal or pleural hairs absent; longest spinal hairs on tergite III to 0.039 mm long, acute or with a fine almost invisible apex; the 2—4 hairs on tergite VIII up to 0.060 mm long. Marginal tubercles darkish, cylindrical with rounded tops to bluntly conical, besides on tergites I and VII (basal diameter 0.030—0.040 mm) also regularly on tergites II—IV and VI on which they are about half that wide. Head blackish; front sinuate; frontal hairs fine, to 0.048 mm long; dorsal cephalic hairs at least as long. Antennae about 3/5 of length of body, with blackish basal segments and pale flagellum, apparently without darker apices to segments III—V; segment III without rhinaria, ventrally imbricated, dorsally apparently smooth, though other segments on both sides imbricated, with fine, erect hairs of up to 0.035 mm, about 1 1/3 times as long as diameter of segment at its somewhat constricted base; segment VI about as long as III, with short processus terminalis. Rostrum not quite reaching hind coxae; last segment about 0.115—0.125 mm long, subequal in length to 2nd joint of hind tarsi, with 2 hairs besides the 3 subapical pairs. Legs pale with dark apices especially the hind femora, and tibiae; longest hair on trochanter 1 1/5 times as long as suture between trochanter and femur; dorsal hairs on tibiae long and fine, inclined, on basal half to 0.055 mm long, distinctly longer than the more spiny ventral hairs, and longer than local diameter of tibiae; first tarsal joints with 3, 3, 2 hairs; second joint of hind tarsi to 3 times as long as apical diameter of hind tibiae. Siphunculi evenly black, with dense, rather long, subacute imbrications over whole length, about 1/6 of length of body, rather evenly tapering from base to the small flange. Cauda blackish, fingertip-shaped, about 2/3 of length of siphunculi, with 10—14 long, curved hairs with fine apices. Subgenital plate with 10—12 hairs on posterior part, and 2—3 on anterior half.

Measurement in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Cau.	Siph.
1	1.78	1.08	0.28	0.19	0.19	0.11 + 0.17	0.28	0.20
2	1.77	1.11	0.26	0.20	0.18	0.12 + 0.21	0.28	0.20
3	1.94	1.10	0.28	0.19	0.17	0.12 + 0.20	0.32	0.22
4	1.92	1.13	0.29	0.20	0.18	0.12 + 0.20	0.31	0.23

(1—4, from *Mulinum* sp., Bariloche, Neuquen, Argentine, 15.I.'64, leg. D. C. Lloyd).

Discussion. The four specimens were in very good condition in an excellent balsam slide received from Dr. R. C. Dickson, Riverside. I received no reply to a letter with a request for further information about the material. Because the slide contained two very similar *Aphis* spp., it had to be remounted. During the process specimens came in contact with a rubbery glue used for fixing labels, and they were badly damaged. Fortunately the measurements and description were made before remounting.

Because abdominal tergite VIII has only a very short transverse sclerotic bar, and only 2 hairs, this species is not affiliated to North American *Aphis* with a markedly sclerotized dorsum in apterae viviparae. It has all the characters of the European *craccivora,* or rather *medicaginis* group, for abd. tergites II—IV show consistently marginal tubercles. In that group only one species is known with long antennal, tibial and dorsal body-hairs: *Aphis comosa* Börner. But that species has only 6—9 caudal hairs, and a solid sclerotic dorsal shield that does not tend to be divided into separate bars, but is merely becoming reduced on its anterior part in specimens that are starved. All other species with rather long siphunculi have much shorter hairs.

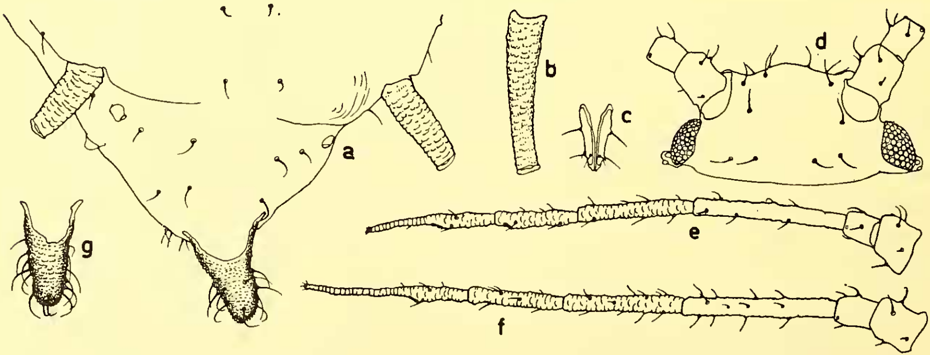

Fig. 8. *Aphis mulinicola* spec. nov. Apt. viv. fem.: a, posterior part of abdomen; e, antenna. *Aphis mulini* spec. nov. Apt. viv. fem.: b, siphunculus; c, last rostral segment; d, head; f, antenna; g, cauda. All × 72

Types. Holotype: apterous viviparous female (measurements no. 1), from *Mulinum* sp., Bariloche (Patagonia), Argentine, 15.I.'64, leg. D. C. Lloyd. Paratypes: apterae viviparae with collecting data as for holotype.

Aphis mulinicola spec. nov.

Apterous viviparous female.

Colour unknown. Strikingly like the preceding species. Differing in the following characters: dorsal sclerotisation much more extensive, consisting of a large spino-pleural, intersegmentally hardly perforated patch which on tergite V is linked to the marginal sclerites; marginal sclerites present, and bearing the marginal tubercles; tergite VIII with a rather long sclerotic transverse bar bearing 2—4 hairs. Marginal tubercles lower, but similar as to size and arrangement. Antennae with segments I—V similar in length to those in *A. mulini,* but processus terminalis not longer than basal part of segment VI. Last rostral segment 0.14 mm long, just longer than second joint of hind tarsi. Siphunculi only 1/10 of length of body, almost without a flange, thick, slightly curved outwards. Cauda thick, as long as or longer than siphunculi, with 8—10 normal, curved hairs. In all other respects like *Aphis mulini.*

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Siph.	Cau.
1	1.81	0.99	0.26	0.19	0.16	0.13 + 0.12	0.17	0.20
2	1.84	1.06	0.28	0.20	0.18	0.13 + 0.13	0.17	0.17

(1—2, from *Mulinum* sp., Bariloche, Neuqen, Argentine, 15.I.'64, leg. D. C. Lloyd).

Discussion. The two available specimens were in a slide with the preceding species, but survived the remounting process slightly better. They were first mistaken for fundatrices of *Aphis mulini* spec. nov. I then compared a great number of fundatrices with apterae of later generations of similar members of the genus *Aphis*. It became evident, that, if they were fundatrices, there probably would have been either 5 antennal segments, or also ant. segments III—V should have been distinctly shorter than they were in *Aphis mulini* spec. nov. The date of collecting 15.I.'64 at Bariloche, which is about 41° S. of the equator, would be comparable with 15 July at New York on the Northern Hemisphere, at which date one could expect fundatrices only as far north as Greenland, or near a glacier.

Also this species belongs in the *craccivora* group because of its dorsal sclerotisation, but species with such long hairs, marginal tubercles on tergites II—IV, and siphunculi not longer than the cauda, were not previously found in that section of *Aphis* L.

Types. Holotype: apterous viviparous female (measurements no. 2), from *Mulinum* sp., Bariloche (Patagonia), Argentine, 15.I.'64, leg. D. C. Lloyd. Paratype: apterous viviparous female with collecting data as for holotype.

Aphis ribiensis Gillette & Palmer, 1929

Syn.: *Aphis nasturtii* Palmer, 1936, 1952 nec Kaltenbach, 1843.

On 17-IX-1956 the late Dr. F. C. Hottes and I found at Carson's Hole near Grand Junction, Colo., U.S.A., a small *Aphis* on stems and leaves of *Veronica americana* var. *crassata.* In a plastic bag with some water the larvae developed into alate females, males, and one ovipara. This suggested that the *Aphis,* which in life strongly resembled *Aphis nasturtii* Kltb., had host alternation.

The mounted aphids fitted the description of Palmer (1936, 1952) of *Aphis nasturtii,* but they differed from the real *nasturtii* Kltb. by having much shorter siphunculi and processus terminalis. Palmer described her *A. nasturtii* from various *Rorippa* species, some of which are also hosts of *Aphis nasturtii* Kltb.

Through the kindness of Dr. Fronk it became possible to examine most of the samples to which Palmer (1952) refers. Undoubtedly the *Aphis* from *Veronica* is the same as Palmer's *A. nasturtii.* But in her slide from *Rorippa,* Ft. Collins, Colo., 21-VIII-1918, leg. L.C.B(ragg) there is also an aptera and an alate of the real *A. nasturtii* Kltb. And in one from Twin Lake, Pingree Park, Colo., from *Rorippa obtusa,* 15-VIII-1932, leg. M.A.P(almer) there is also one aptera of *A. nasturtii* Kltb. The latter aphid is described by Palmer (1952) as *A. abbreviata* Patch from *Rhamnus cathartica,* Ft. Collins, a synonym of *A. nasturtii* Kltb. and the identification appears to be correct.

Palmer (1952) wrote under *Aphis ribiensis* Gillette & Palmer: "this species seems to show no distinguishing characters from *Aphis nasturtii;* however, since no host transfers have been done the two species will be held distinct for the present". To European aphid workers the identity looks improbable, but this is not the case when one knows what Palmer meant by *Aphis nasturtii.* Type material of *A. ribiensis* was received, with the kind permission to remount, from the U.S. National Museum and from the Colorado A. & M. College, Ft. Collins, Colo. I have no doubt that *Aphis ribiensis* Gill. & Palmer is the aphid from *Rorippa* spp. and *Veronica americana.* Apterae, alatae and oviparae fully agree. Typical are the protected spiracles on the abdomen, of a type often found in aphids living in very wet surroundings.

A. ribiensis is the only American *Aphis* from *Ribes* with only two accessory hairs on the last rostral segment as correctly figured by Palmer (1936, 1952). However, specimens identified by Prof. Palmer as *Aphis ribiensis,* from *Ribes aureum,* Nibley, Utah, leg. G. F. Knowlton, show 5—7 accessory hairs on the last rostral segment which is 0.12 mm long. The latter specimens agree best with *Aphis ribigillettei* Knowlton & Allen which is virtually indistinguishable from *Aphis oenotherae* Oestlund.

I should like to point out the similarity in structure and life cycle between *Aphis ribiensis* and the European *Aphis triglochinis* Theob., both with only two accessory hairs on the last rostral segment, and having host alternation between *Ribes* and aquatic or semiaquatic plants.

Masonaphis (Ericobium) corylina (Davidson, 1914)?

Apterous viviparous female.

Colour in life not known. In mounted specimens body broadly spindle-shaped, about 2.50—2.70 mm long. Tergum not distinctly sclerotic, locally with fine, long, irregular, transverse ridges, especially on the anterior abd. tergites. Small spinal tubercles on vertex and abd. tergite VIII. Marginal tubercles small and low, irregularly present on some of tergites II—IV. Dorsal hairs rather thick and stiff, with spear-shaped apices, spinally on tergites I—III about 0.025 mm long; tergite VIII with 4 hairs 0.048—0.052 mm long. Frontal tubercles smooth, well developed, with slightly diverging inner sides, at their inner apices with 2 hairs of about 0.035 mm long, ventrally with 1—3 more hairs; sinus frontalis conspicuously wide and with nearly flat bottom. Antennae about 1 1/15 times as long as body; basal segments brownish, slightly darker than the head; flagellum evenly darker to blackish brown from near base to apex; segment III finely imbricated from base to apex, near base with 2—3 hardly elevated, flattish rhinaria; processus terminalis nearly 6 times as long as base of segment VI, with some 9—12 spiny hairs besides the 4 on apex; segment III with about 22—28 hairs the longest of which is up to 2/3 basal diameter of segment. Rostrum just reaching hind coxae as measured by stylets; last segment with 14—16 hairs besides the 3 pairs near apex, 0.154—0.161 mm long, nearly 1½ times as long as second joint of hind tarsi. Legs about as pale as basal half of ant. segment III, with the conspicuously bent apical 1/6—1/5 part of tibiae blackish brown; femora on distal half ventrally, and near apex dorsally, slightly scabrous; dorsal hairs at mid-length of tibiae 0.035—0.045 mm long, to as long as local diameter of tibiae; first tarsal joints with 5, 5, 5 or 5, 5, 4 hairs, second joints ventrally hairy, rather bluntly imbricated, and without spinules on imbrications. Siphunculi pale, apicad gradually darker to brownish, distal 1/8 part rather dark brown; imbricated evenly and superficially from base to near apex, with distal 1/9—1/8 reticulated; smallest diameter on basal half about 0.050 mm, largest width in swollen part 0.061—0.065 mm, in the reticulated area about 0.078 mm wide; flange thin, distinct. Cauda pale, elongated bluntly triangular, not constricted, about 3/7 of length of siphunculi, with 7 hairs. Subgenital plate with about 10—12 hairs along posterior margin, and 2 much longer ones on anterior half.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Rhin.	Siph.	Cau.
1	2.66	2.80	0.68	0.46	0.44	0.15 + 0.87	3 & 3	0.71	0.32
2	2.54	?	0.77	0.45	0.47	0.15 + > 0.72			

(1—2, from *Aquilegia formosa,* Tioga Pass (3300 m.), Calif., U.S.A., 17.VII.'73, leg. D. Voegtlin no. 75).

Discussion. *Masonaphis* (*Ericobium*) *corylina* (Davidson, 1914) was only known as alatae, from *Corylus* sp., but Mason (1925) writes that according to Davidson the aphid is common on *Physocarpus capitatus.* That is a most unusual host combination for a *Masonaphis.* It is not clear whether the alatae developed on *Corylus* or had landed there. Notwithstanding much searching no *Masonaphis* could later be found on *Corylus* or *Physocarpus.*

At my request Mr. David Voegtlin searched *Aquilegia formosa* for more specimens of *Megourina lagacei* spec. nov. He collected some larvae of that species, and some larvae of *Kakimia aquilegiae* (Essig), but also two adult, slightly damaged apterae and two larvae of a *Masonaphis* (*Ericobium*). With the key in MacGillivray (1958) one arrives at or near *Masonaphis* (*Ericobium*) *corylina* and my Voegtlin specimens may well belong to that species. This can only be decided when alatae have been collected from *Aquilegia,* or apterae viviparae from *Corylus.*

Masonaphis magna spec. nov.

Apterous viviparous female.

Colour in life not known. In mounted specimens body elongate oval, about 4.00—4.50 mm long. Tergum somewhat sclerotic but evenly faintly yellowish pigmented, not quite smooth. Marginal tubercles usually present on tergites II—IV, inconspicuous, 0.007—0.013 mm in diameter, rather flat; spinal tubercles of the same size common on the head and tergite VIII. Dorsal hairs stiff, blunt, spinally on tergites I—III about 0.035 mm

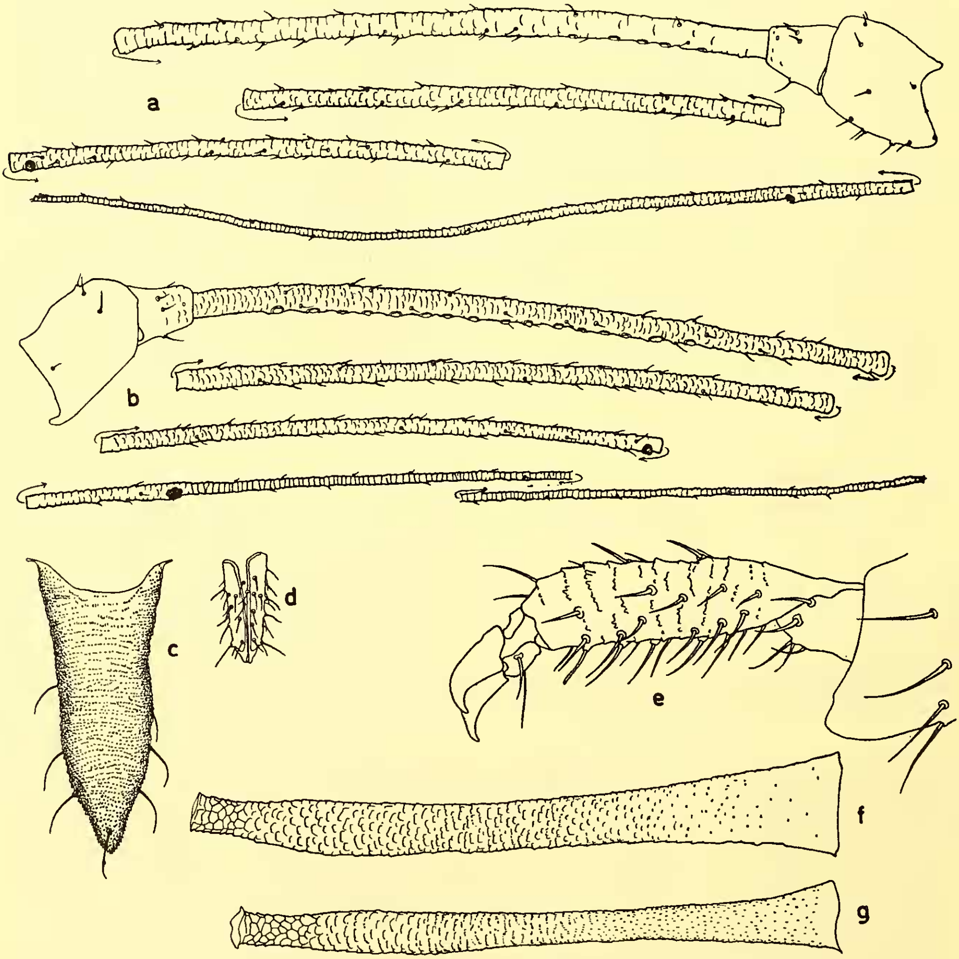

Fig. 9. *Masonaphis magna* spec. nov. Apt. viv. fem.: a, antenna; d, last rostral segment; e, tip tibia + hind tarsus; f, siphunculus. Al. viv. fem.: b, antenna; c, cauda; g, siphunculus. a, b, c, d, f and g, × 72; e, × 362

long, about 12 per segment; tergite VIII with 6—8 hairs up to 0.065 mm long. Frontal tubercles with a few spinules on underside, diverging, with rather straight inner sides, with 3—4 hairs; sinus frontalis bluntly V-shaped; median frontal process not developed; antennae very long, to over 1 1/3 times length of body, pale brownish yellow, with the very junctions between segments III/IV and IV/V dark brown, distal part of segment V and all of VI dark brown; segment III evenly imbricated from base to tip, with in the available specimens 5—8 rather evenly spread, hardly elevated, not bulging rhinaria in a line on basal 1/3—2/5 part; processus terminalis 5—6 1/4 times as long as base of segment VI, with no less than 12—20 spiny hairs besides the 4 on apex; segment III with some 30 blunt hairs, up to 0.022 mm long, about half basal diameter of the segment. Rostrum short, reaching to middle coxae as measured by stylets; last segment very hairy, with 26—30 hairs besides the 3 subapical pairs, 0.190—0.205 mm long, to 1 2/3 times as long as the small second tarsal joints of hind legs. Legs long, slender, pale, with the conspicuously bent apices of the tibiae blackish brown; femora dorso-apically and laterally somewhat imbricated; longest ventral femoral hair 0.045 mm long; dorsal hairs halfway hind tibiae about 0.045 mm, about 2/3 of local diameter of tibiae; apices of all tibiae conspicuously hairy, with quite acute hairs; first tarsal joints with 5, 5, 5 hairs, second joints hairy, sharply imbricated with rather distinct spinules on the imbrications. Siphunculi pale with conspicuously blackish apical 1/12—1/10 part, about ¼ of length of body, imbricated from near base with apical 1/10 part distinctly reticulated, at base about 0.13 mm, from there gently tapering to halfway their length, to 0.075—0.080 mm, increasing in diameter to a maximum of 0.088—0.092 mm, with the dark, reticulated apex about cylindrical, much attenuated, only 0.050—0.055 mm wide; flange small. Cauda pale, about half the siphunculi, with 8 hairs, one of which is dorso-apical; shape not describable in available specimens. Subgenital plate with 16—20 hairs along posterior margin, two longer ones near anterior margin and 1—4 hairs on the disc.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Rhin. on III	Siph.	Cau.
1	4.22	4.75	1.13	0.92	0.85	0.25 + 1.32	5 & 6	1.09	0.48
2	4.19	5.78	1.19	1.20	1.05	0.28 + 1.77	8 & 8	1.19	0.64

(1, from Composite, 4 mi. E. of Sturgeon Heights, Alberta, Canada, 14.VI.'66, leg. A.P.G. no. F 66—7—14 a; 2, from Composite, Mobley Lake, British Columbia, Canada, 12.VII.'66, leg. F.G.A.—A.P.G. no. F 66—7—12 b).

Alate viviparous female.

Colour in life unknown. In mounted specimens body even larger than in apterae, 4.30—4.55 mm long; head and pronotum quite pale with some brown on the medial side of the ocelli, mesonotum light brown, abdomen not pigmented. Antennae very long, with segment I vaguely brownish, segment II and base of segment III basad rhinaria pale, rest dark brown to brownish black, but segment IV on basal half lighter than segment III; segment III with 17—19 rhinaria similar to those in apterae, very nearly all in line, on basal ¾ part. Legs as in apterae but femora dorso-apically brownish. Wings with normal venation, veins brown, not bordered, but posterior margin of pterostigma with a brown border contrasting to the much paler stigma. Siphunculi much thinner than in apterae, on basal half down to 0.050 mm, in the swollen portion up to 0.075 mm, and in the reticulated 2/15 part down to 0.055 mm. Cauda with 7—9 hairs, flattened in the slides. Other characters as in apterae viviparae.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Rhin. on III	Siph.	Cau.
1	4.34	5.56	1.26	1.18	1.00	0.30 + 1.54	18 & 19	1.05	0.51
2	4.53	5.58	1.14	1.03	1.00	0.37 + 1.64	17 & 18	1.05	0.56

(1, with aptera no. 1; 2, from Composite, Lac La Hache, British Columbia, Canada, 6.VII.'66, leg. F.G.A. no. F 66—7—6 t).

Discussion. From the fact that this aphid was collected on one trip at three different localities, it would seem to be fairly common. Unfortunately the Composite on which all specimens were found was not identified.

It is very difficult to decide to which subgenus of *Masonaphis* H.R.L. this species belongs. The imbrications on its second tarsal joints are about as spinulose as they are in *M. lambersi* MacGillivray which one would classify as a *Masonaphis* sensu stricto. No such aphid has been recorded from Compositae before. It is certainly not a member of subgen. *Oestlundia* H.R.L. (pale head and thorax, no ornamentation in wings) or *Amphorophorina* MacGillivray (arrangement of rhinaria). This leaves *Masonaphis* sensu stricto and *Ericobium* MacGillivray. With MacGillivray's (1958) key to *Masonaphis* sensu stricto one could arrive at *M. rhokalaza* (Tissot & Pepper), but that species has dark siphunculi, and fewer hairs on the last rostral segment. In her key to subgen. *Ericobium* one arrives at *M. phacelia* Essig, but that species has much less reticulation to the siphunculi, long dorsal hairs, and a virtually smooth antennal flagellum. The tarsi are very small. The hind tibiae are about 28 times as long as the second tarsal joints (0.122 mm).

Because of its very large size, hairy last rostral segment, small tarsi and clear wings this aphid should be easily recognizable.

Types. Holotype: alate viviparous female (measurements no. 1) from Composite, 4 mi. E. of Sturgeon Heights, Alberta, Canada, 14.VII.'66, leg. A.P.G. no. F. 66—7—14 d. Paratypes: aptera vivipara with data as for holotype; alate viviparous female, from Composite, Lac La Hache, British Columbia, Canada, 6.VII.'66, leg. F.G.A. no. F 66—7—6 i; apterous viviparous female, from Composite, Mobley Lake, British Columbia, Canada, 12.VII.'66, leg. F.G.A.—A.P.G. no. F 66—7-12 b.

Megourina gen. nov.

Type-species: *Megourina lagacei* spec. nov. Very similar to *Megourella* H.R.L., 1949, but differing by: 5 or 4 hairs on the first tarsal joints instead of 3 hairs; median frontal process distinct; sclerites in alatae obsolete on anterior abdominal tergites (always?); yellow instead of black tibiae; marginal hairs on processus-like sclerites, like other dorsal hairs with slightly capitate, very transparent tips.

Discussion. The type and single species was first considered to belong to a subgenus of *Megourella,* but there is no conceivable phylogenetic connection with that genus. Therefore the strong resemblance of *M. lagacei* to the two *Megourella* species must be considered convergence. The hairy rostrum, the structure of the dorsal hairs and the shape of the front suggest relationship to the Nearctic *Kakimia*'s, associated with Saxifragaceae, Scrophulariaceae and also *Aquilegia.*

Megourina lagacei spec. nov.

Apterous viviparous female.

Colour in life not known. In mounted specimens body oval, about 2.50—2.95 mm long, about 1.40 mm wide. Tergum membranous, with dark brown scleroites about 0.016—0.050 mm in diameter at the bases of the spinal and pleural hairs, with very strongly convex, processus-like, dark brown marginal sclerites, well developed antesiphuncular and rather smaller postsiphuncular sclerites, and a narrow, lighter brown spinal bar across tergite VIII. Distinct semiglobular marginal tubercles, 0.006—0.013 mm in diameter, singly, or sometimes in pairs or complex, regularly present on each marginal sclerite on tergites II—V. No spinal tubercles present. Dorsal hairs on strong bases, thick, stiff, dark, with seemingly finely furcated apex, but actually with a colourless thin knob, spinally on abdominal tergite III about 0.035—0.055 mm long, the 4 hairs on tergite VIII thinner and up to 0.065 mm long; marginal sclerites with 2—4 hairs each; about 14—16 hairs on each of abdominal tergites I—IV, of which the innermost pairs have much smaller scleroites at their bases than the others. Head pale brown, smooth, with only on the upper apex of the large, parallel, frontal tubercles a few nodules or spinules; median frontal process seemingly absent, somewhat downwards. Antennae about as long as body; first segment distinctly darker than head; segment III slightly imbricated, blackish brown with pale basal portion and often also with a part distad the rhinaria lighter, with 24—40 small, and sometimes some very small, slightly elevated, bulging rhinaria irregularly arranged along 2/3—4/5 part of the segment, about twice as long as segment IV; the latter on basal part mostly lighter than apical part of segment III, distally brownish black like the more distal segments, without rhinaria; processus terminalis 5—5½ times base of segment VI, with 7—10 small spiny hairs besides the 4 at the top; hairs on segment III about 14—18 in number, stiff, the longest one as long as basal diameter of the segment. Rostrum (according to stylets) reaching beyond middle coxae; last segment about 0.150—0.160 mm long, about 1 2/5 times as long as second joint of hind tarsi, conspicuously hairy, with some 16—20 hairs besides the much longer 3 subapical pairs. Legs rather long; femora with blackish brown distal part, gradually paler from there to base; tibiae pale to brownish yellow with blackish brown apices; first tarsal joints mostly with 5 hairs, the slightly stouter middle one the shortest, but apparently sometimes on one or two legs with 4 hairs, one of the lateral ones missing; tarsal joints rather small, imbricated. Siphunculi blackish, about 1/5 of length of body, on basal part with a few single spinules, remainder smooth, with a slender cylindrical basal 1/3 part about 0.055 mm wide, distad gently increasing in diameter to a maximum of about 0.070—0.075 mm, and evenly decreasing to a tip which is almost exactly as wide as the thinnest part on basal half; flange small, about 1 1/7 times as wide as the slightly incised part just below. Cauda dark, about 3/5 of the siphunculi, rather thick, slightly tapering over 4/5 part, then rather suddenly tapering to the blunt apex, with probably 5—7 normal hairs (sometimes one hair of the lateral 3 pairs, sometimes the dorsal-apical hair absent). Subgenital plate with 8—12 hairs along posterior margin, 2 longer hairs on anterior part, but also 8—10 hairs on the middle portion.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Rhin. on III	Siph.	Cau.
1	2.89	2.96	0.92	0.44	0.43	0.15 + 0.81	32 & 38	0.57	0.31
2	2.69	2.61	0.82	0.38	0.38	0.15 + 0.77	24 & 27	0.52	0.29
3	2.68	2.66	0.79	0.39	0.36	0.15 + 0.73	26 & 27	0.52	0.27
4	2.63	2.83	0.86	0.42	0.39	0.15 + 0.80	26 & 30	0.53	0.30
5	2.80	3.03	0.95	0.43	0.44	0.17 + 0.82	32 & 32	0.53	0.30
6	2.81	2.73	0.85	0.40	0.37	0.15 + 0.73	25 & 27	0.48	0.29

(1—6, from *Aquilegia formosa,* Plaskett Creek, Highway no. 1, Monterey Co., California, U.S.A., 5.IV.'61, leg. C. Lagace no. 66—IV—5 a).

Alate viviparous female.

Colour in life unknown. In mounted specimens head and thorax blackish brown; abdomen almost without scleroites except at bases of spinal hairs of tergites V—VIII, but with larger marginal sclerotic processes than in apterae. Antennae very dark with only base of segment III pale; rhinaria on segment III except at the very base larger than in apterae, and covering most of the circumference of the segment up to its top. Legs much darker than in apterae. Wings with normal venation, the veins dark, not bordered. Other characteristics much as in apterae, but siphunculi and cauda slightly more slender.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Rhin. on III	Siph.	Cau.
1	2.95	2.99	0.92	0.44	0.44	0.15 + 0.82	49 & 55	0.53	0.27
2	2.64	2.80	0.85	0.43	0.39	0.15 + 0.77	47 & 47	0.46	0.24

(with apterae nos. 1—6).

Discussion. This aphid, according to specimens in the Essig collection, has been collected several times before in California, from *Aquilegia formosa,* which host plant it shares with *Kakimia aquilegiae* (Essig). Since it greatly differs from all other Nearctic aphids, and its resemblance to the European *Megourella* spp. was discussed and p. 27, no further discussion is necessary.

The species is dedicated to the late Mr. C. Lagace, who collected this and many other fascinating aphids.

Types. Holotype: apterous viviparous female (measurements no. 1), from *Aquilegia formosa,* Plaskett Creek, Highway no. 1 (Monterey Co.) California, U.S.A., 5.IV.'66, leg. C. Lagace no. 66—IV—5 a. Paratypes: apterae viviparae and two alatae with collecting data as for holotype. Some paratypes in the Lagace collection, Albany, California, U.S.A.

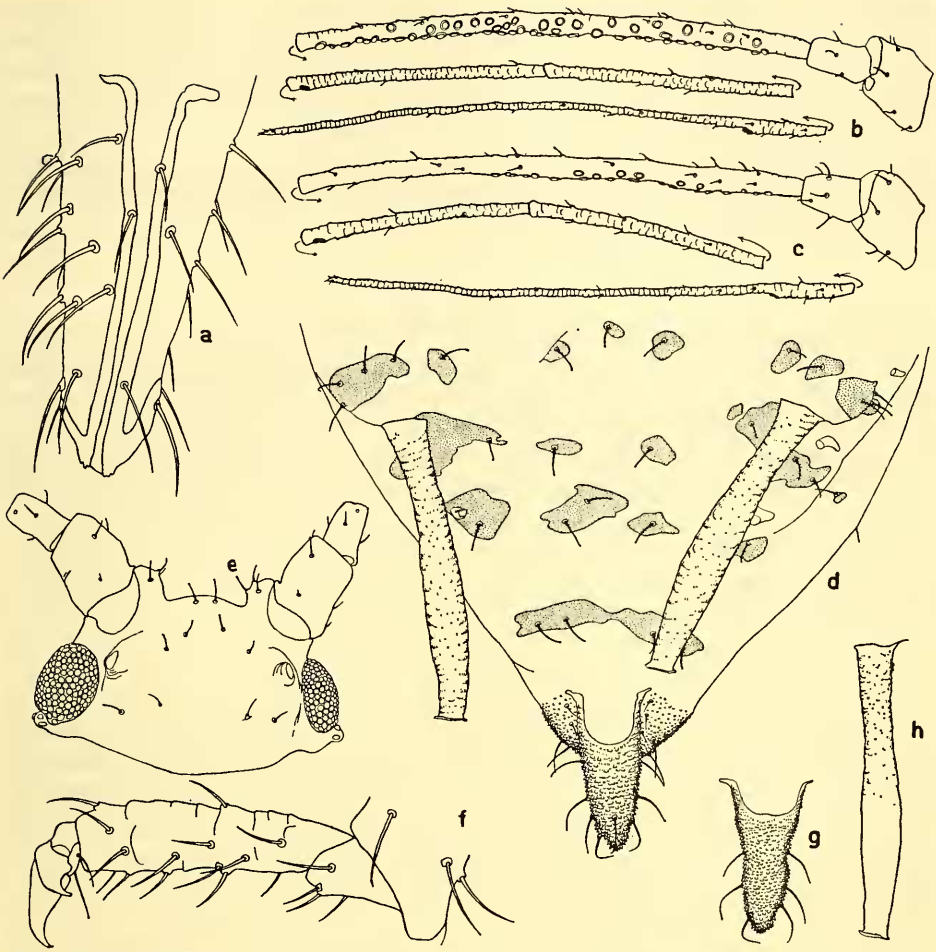

Fig. 10. *Megourina lagacei* spec. nov. Apt. viv. fem.: a, last rostral segment; c, antenna; d, posterior part of abdomen; f, tip tibia + hind tarsus. Al. viv. fem.: b, antenna; e, head; g, cauda; h, siphunculus. a and f, × 342; b, c, d, e, g and h, × 75

Nearctaphis argentinaeradicis (Gillette & Palmer, 1932)

According to the type material this apparently very rare aphid belongs in *Nearctaphis* Shaposhnikov, and not in *Aphis* L. in which it was described.

The following items supplement the descriptions and figures by Gillette & Palmer (1932) and Palmer (1952).

Apterous viviparous female. Head dorsally with about 24—30 hairs besides the 6—8 on the front, covered with blunt spinules or nodules. Last rostral segment to 0.18 mm, with 4—6 hairs besides the 3 subapical pairs, $1\frac{1}{2}$ times as long as second joints of hind tarsi. Dorsum of thorax and abdomen covered with little scleroites, bearing hairs, but many hairs not on scleroites; tergite IV with 40—55 hairs, about 0.065 mm long, with extremely fine apices; tergite VIII with 12—16 hairs. Marginal tubercles present on abd. segments I—V, not on VI or VII, irregular in shape, and those on segment V larger than all the others and composite, in dorsal view looking like an *Eriosoma* wax gland. First tarsal joints with 4 hairs, 2 short and thick, 2 long and thin. Siphunculi with transverse rows of bluntish spinules, with a rather wide flange.

With the kind permission of Dr. D. Fronk several paratypes collected 23.VIII.1930 and bearing the number 4830 were remounted and for the greater part returned to the Palmer collection at Fort Collins, Colorado.

Neonasonovia inflata (Richards, 1962)

The species was described as a *Hyperomyzus*. But old apterae develop a vague brown central sclerotic patch on the abdomen in combination with black siphunculi, while alatae have an equally vague abdominal sclerotic pattern not at all like that in the four real *Hyperomyzus*. Therefore I transfer *Hyperomyzus inflatus* Richards, 1962, to *Neonasonovia*. Miss E. M. Patch recognized the species as new and gave a manuscript name to specimens collected on 30.VII.'26 near Portland, Maine, U.S.A. on *Hieracium*, by Mrs. I. M. Knight, and it was found in several localities in North Carolina by C. F. Smith, J. O. Pepper and myself in 1963 and 1964. In the latter state it evidently overwinters on *Hieracium*, for apterae, alatoid nymphs and alatae were found on 24.IV.'64 in two localities.

Neonasonovia nabali (Oestlund, 1886)

This species, described as *Rhopalosiphum nabali* from *Nabalus albus*, now *Prenanthes alba*, is mostly treated as an *Amphorophora* Buckton in North American papers. Its sexuals have not been recorded or described but I found them in very large numbers on 28.VIII.'56 in the Laurentide Park, Prov. Quebec, Canada, on the undersides of the leaves of *Ribes glandulosum*. Alate males are brownish red, first instar oviparae greenish yellow, after their first moult brilliant brownish red. Eggs at first very pale transparent green, later black, on the branches.

In my hotel at Fredericton, N.Br., Canada, I transferred alatae from *Prenanthes* sp. to leaves of *Ribes nigrum* and very soon obtained similar larval oviparae, and it would seem that *Ribes* spp., at least *R. glandulosum*, are primary host plants of this species which I transfer to *Neonasonovia* H.R.L.

Amphorophora fronki Knowlton, 1945, described from "Wild Currant" (= *Ribes* sp.) is extremely nearly related to *Neonasonovia nabali* and congeneric. I could remount some apterae from the type sample, one of which, though full of embryos, has a few pseudosensoria on one atrophied hind tibia. I found up to 23 rhinaria on antennal segment III, much fewer than in *nabali*, in which species the apterae from *Prenanthes alba* have mostly about twice that number of rhinaria, which are smaller in size, in addition to several on segment IV and sometimes V. But such a difference in number of rhinaria is, in *Neonasonovia* and related genera, common between spring forms on the primary host plant and summer forms from the secondary host plants. The swelling of the siphunculi is similar, and rostrum, cauda, chaetotaxy, etc., do not show differences. Only the large pigmented spinal scleroites of *N. nabali* from *Prenanthes* cannot be found in remounted *N. fronki*, a case refound in *N. picridis* (Börner & Blunck), the type-species.

However, the number of rhinaria in alate *N. fronki* is certainly much lower than that in gynoparae of *N. nabali.* Besides, an ovipara was found on *Ribes* in July. Therefore *nabali* Oestl. and *fronki* Knowlton must be considered different taxa as long as no authentic spring forms from the primary host, *Ribes glandulosum,* of *Neonasonovia nabali* are known.

Probably *Amphorophora petiolaris* Knowlton & Allen, 1945, described as spring alatae from *Ribes petiolaris,* Washington, also belongs to this group. I have not seen authentic material. The host plant occurs in Utah. The name *petiolaris* may have priority over *fronki.*

Neonasonovia nigra (J. McVicar Baker, 1934)

Julia McVicar Baker's aphids have received very little attention. Therefore it seems useful to publish a more modern description of one of her species, originally described as an *Amphorophora* from *Stevia pubescens,* from Mexico. She mentioned about 30 rhinaria on ant. segment III, 18 on IV, 4—5 on V, some more than in my material.

Apterous viviparous female.

Colour in life, according to Baker's description, very shiny black. In mounted specimens body oval, about 1.30—1.55 mm long, about 0.60 mm wide, strongly convex. Tergum with a solid, black, smooth shield extending from the suture-less fused tergites of metathorax to abdominal segment V, and reaching down laterally to between the stigmal pori; tergites VI—VIII with free sclerotic bars. No marginal or spinal tubercles present. Dorsal hairs inconspicuous, blunt, only 0.004—0.008 mm long spinally on abdominal tergites I—III; the 4—6 hairs on tergite VIII very little longer, to 0.010 mm, about half as long as basal diameter of antennal segment III. Head frontally as dark as abdominal dorsum, caudad paler; frontal tubercles not much developed, diverging, with rounded inner sides, smooth, with 2 short hairs; median frontal process rounded, very prominent, nearly half as high as the frontal tubercles. Antennae about as long as body or slightly longer, blackish with only the very base of segment III pale; segment III near base distinctly imbricated, more distally very lightly imbricated, along one side over its whole length with 16—26 slightly elevated, a little bulging rhinaria, not in line but nearly so; segment IV with 0—10 rhinaria; processus terminalis 3½—5 times as long as base of segment VI, with 2—4 small spines besides the 4 at apex; hairs on segment III inconspicuous, to about 0.005 mm long, only 1/5—1/4 of basal diameter of the segment. Rostrum reaching halfway between middle and hind coxae, last segment about 0.105—0.115 mm long, about 1 1/3 times as long as second joint of hind tarsi, with some 7—9 thin hairs of 0.013—0.021 mm besides the 3 pairs near apex. Legs in more pigmented specimens most conspicuous because basal 1/3 part of tibiae is pitch black, much darker than any other part of body or appendages; femora blackish brown, paler brown towards base; longest ventral femoral hair about 0.09 mm long; tibiae with middle 1/3 part pale to yellowish brown, at apex paler than on basal part; dorsal hairs halfway hind tibia inconspicuous, to 0.009 mm long; first tarsal joints with 3, 3, 3 hairs; second joints distinctly imbricated. Stigmal pori of abdominal segments I—V open, nearly circular. Siphunculi blackish, smooth except for distinct striation in the annular incision below the flange, 2/9—1/4 of length of body, strongly swollen; at base about 0.070 mm wide, just above 0.050 mm, then widening to about 0.090 mm halfway their length and gradually decreasing in width to 0.028 mm in the incision below the flange of about

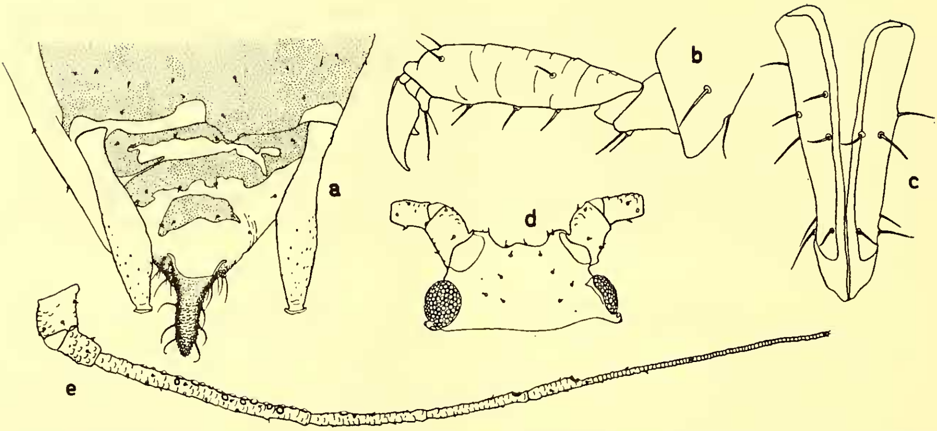

Fig. 11. *Neonasonovia nigra* (J. M. Baker). Apt. viv. fem.: a, posterior part of abdomen; b, tip tibia + hind tarsus; c, last rostral segment; d, head; e, antenna. a, d and e, × 72; b, and c, × 342

0.037 mm. Cauda pale, slender, narrow-conical with a mostly distinct constriction, 6/11—2/3 of the length of the siphunculi, with 5—6 normal hairs (mostly with a dorso-apical one). Subgenital plate with 8—10 short, blunt hairs along posterior margin, with 2 hairs of up to 0.020 mm near anterior margin.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	IV	Rhin. on III	IV	Siph.	Cau.
1	1.32	1.48	0.40	0.20	0.19	0.09+0.46	19&20	0&1	0.33	0.18
2	1.46	1.40	0.38	0.23	0.20	0.10+0.35	16&19	2&3	0.34	0.20
3	1.43	1.41	0.39	0.21	0.20	0.10+0.36	18&21	7&3	0.34	0.18
4	1.52	1.55	0.45	0.23	0.22	0.10+0.40	22&26	8&10	0.36	0.20

(1—4, from *Stevia glandulosa,* 62 mi. E. of Villa Union, Sinaloa, Mexico, 1.II.'64, leg. R. van den Bosch no. 64—2—1 f).

Discussion. Four adult apterae without larvae were collected by Dr. van den Bosch. They are classified with some reluctance as *Neonasonovia* although they have short hairs. However, the shape of the front, antennae including their sensoriation, round, not covered stigmal pori, siphunculi with annular incision below the flange are so typical that on these characters a decision is easy. Besides, the hairs in *N. inflata* (Richards) are not much longer, and *N. hieracii* (Börner) has a position more or less intermediate between *inflata* and the type species, *picridis* Börner & Blunck, as to dorsal hairs.

Because of its extensive black sclerotisation recognition of this aphid is very simple.

Neonasonovia zirnitsi Hille Ris Lambers, 1952

The author (1952) described this species from *Ribes alpinum* and *Euphrasia* sp. from Sweden. At that time the life cycle had not yet been confirmed by transfer experiments.

However, in 1967 I received living specimens on *Ribes alpinum*, found near Denekamp, Netherlands, by the Phytopathological Service, and emigrants successfully colonized potted *Euphrasia nemorosa* on which several generations developed. At my request Mr. van der Schaaf then searched *Euphrasia* in the Denekamp area and he found several specimens on this plant on 28.VII.'67. Therefore *Ribes alpinum* indeed is the primary host plant of *N. zirnitsi* H.R.L. and *Euphrasia* spp. are secondary hosts.

Prevost (1959) described *Hyperomyzus boerneri* from *Euphrasia rostkoviana* and *Euphrasia* sp. from Austria and Switzerland. Morphologically her type material cannot be distinguished from *zirnitsi* developed on *Euphrasia*. Because the type material contained several oviparae and two males (and also an alate oviparous female), it was supposed that *boerneri* was a good species. However, further searching by the present author in Switzerland and Austria revealed that this aphid, which is very common on *Euphrasia* in the Alps, in September produces masses of alatae, settling on *Ribes alpinum* and producing larvae, and some males. I now suppose that colonies remain on the secondary host and that some oviparae are produced there when the temperature has become too low for flight initiation, as in, e.g., *Myzus cerasi* (F.). Therefore *Hyperomyzus boerneri* Prevost, 1959, is considered a synonym of *Neonasonovia zirnitsi* H.R.L., 1952.

Müller (1960) described *Hyperomyzus sobrinus* as host alternating between *Ribes alpinum* and *Euphrasia officinalis*. Nothing distinguishes the paratypes he most kindly gave me from *Neonasonovia zirnitsi* H.R.L., of which *Hyperomyzus sobrinus* Müller, 1966 is considered to be a synonym.

From Iceland Stroyan (1960) described *Hyperomyzus boerneri* subspec. *thorsteinni* from *Euphrasia frigida*. This aphid very strongly resembles *zirnitsi*, but apterae collected in August have the processus terminalis only about 4 times as long as the base of segment VI, instead of 6 or more times as long as in true *zirnitsi*. Since *Ribes alpinum* is not mentioned in the Iceland Flora, *thorsteinni* has apparently been split off the dioecious *zirnitsi*, and has evolved far enough to be considered a species, as I do, transferring it to *Neonasonovia* H.R.L.

Pentamyzus acaenae (Schouteden, 1904)

Through the kindness of Dr. H. Weidner, Hamburg, Germany, I could mount the pickled material of *Rhopalosiphum acaenae* Schouteden, 1904. This appears to be a *Pentamyzus* H.R.L., easily separable from the type-species, *P. graminis* H.R.L., by the wide flange to the siphunculi (0.048—0.052 mm) and the thin part (0.030—0.035 mm) just below, where some transverse striae are present, and by antennal segment III being twice as long as segment IV. Since the original slides seem to have been destroyed, a lectotype, partly from *Acaena splendens*, Uschuaia, Tierra del Fuego, Argentine,

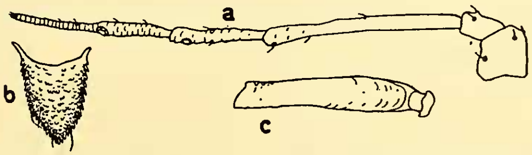

Fig. 12. *Pentamyzus acaenae* (Schouteden). Apt. viv. fem.: a, antenna; b, cauda; c, siphunculus. All × 72

14.XI.'92, leg. H. Michaelsen no. 147, was selected and returned to the Hamburg Museum. Some of the lecto-paratypes, with collecting data as for lectotype, are in the author's collection.

Pentamyzus falklandicus spec. nov.

Apterous viviparous female.

Colour in life not known. In mounted specimens integumentum faintly yellowish. Body elongated oval, 2.40—3.00 mm long, just over twice as long as its greatest width (rather flattened specimens). Thoracic tergites free, tortoise shell-like sclerotic, or rather with elevated, very low flattish warts, but along the median line apparently membranous; abdominal tergites I—VIII similarly sclerotic and mutually free, but the membranous median divide ending at anterior margin of tergite V or perhaps sometimes VI. Very inconspicuous marginal tubercles, probably flat, about 0.005—0.008 in diameter, very irregularly present on abdominal segments II—IV; spinal tubercles regularly present on vertex, irregularly on abdominal tergites VII and VIII where they are more elevated and larger than the marginal tubercles. Dorsal hairs scarce, on tergites I—IV spinally in a very flat trapezoid, about 14—16 per segment, spinally on tergite III to 0.022 mm long, stiff and blunt; tergite VIII with 8—12 mostly slightly longer hairs, to 0.030 mm long, sometimes in a double row. Head broad; frontal tubercles just indicated, slightly protruding beyond the convex front, wrinkled but not spinulose, nodulose or scaly, with 1—2 hairs each. Antennae of 5 segments, pale, with segment V brown, 2/5—3/7 of length of body; segment I on inner side bulging; segment III without rhinaria, superficially bluntly imbricated, more than twice as long as segment IV; processus terminalis 1 1/2—1 6/7 times as long as base of last segment, with mostly 2 spiny hairs besides the 4 near apex of which one is always placed more than its own length below the tip; antennal hairs scarce, only 5—7 on segment III and these half as long as basal diameter of the segment. Eyes normal. Rostrum thick, reaching the middle coxae; last segment acute, almost rostrate, about 0.14 mm long, about 8/9 of second joint of hind tarsi, with 4—6 hairs of about 0.040 mm besides the 3 subapical pairs. Legs rather short and thick, pale with perhaps the tarsi darker; longest ventral femoral hair about 0.030 mm, stiff, bluntish, dorsal hairs on hind tibiae more acute, halfway tibiae about 0.30 mm long, about 2/3 of local diameter of tibiae; first tarsal joints with 3, 3, 2 or 3, 3, 3 hairs; second joints hardly imbricated; empodial hairs about 1/2—3/5 of length of claws.

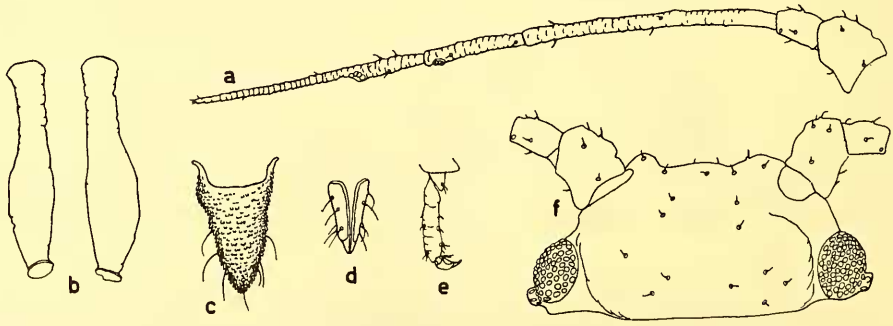

Fig. 13. *Pentamyzus falklandicus* spec. nov. Apt. viv. fem.: a, antenna; b, siphunculi; c, cauda; d, last rostral segment; e, hind tarsus; f, head. All × 72

Siphunculi pigmented like the legs, nearly smooth with some wrinkles near base and some striae near apex, about 1/7—1/6 of length of body, with basal 1/3 part about cylindrical and there about 0.05 mm thick, suddenly strongly swelling to a maximum width of about 0.09 mm and from there tapering to the thinnest part, about 0.045 mm, just below the rather thick flange of about 0.055 mm. Cauda thickly elongated triangular with convex sides, less than half as long as siphunculi and similarly pigmented, with 6—10 normal, acute hairs in irregular arrangement. The three rudimentary gonapophyses unusually large, with spiny hairs of up to 0.030 mm. Subgenital plate with 14—18 bluntish hairs along posterior margin and 2—4 much longer and more acute ones on anterior part.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	Siph.	Cau.
1	2.72	1.19	0.44	0.17	0.15 + 0.25	0.39	0.25
2	3.00	1.27	0.47	0.18	0.16 + 0.25	0.43	0.25
3	2.60	1.24	0.45	0.19	0.15 + 0.27	0.37	0.22
4	2.75	1.26	0.44	0.19	0.15 + 0.28	0.39	0.23
5	2.81	1.37	0.49	0.21	0.18 + 0.29	0.46	0.26
6	2.93	1.26	0.44	0.19	0.15 + 0.28	0.39	0.23
7	2.47	1.18	0.42	0.18	0.14 + 0.26	0.37	0.23

(1—7, from *Poa flabellata,* Falkland Isles, 21.VI.'37, leg. A. G. Bennett no. 8246).

Discussion. The closest relative of this aphid is *P. acaenae* (Schouteden) supposedly living on *Acaena splendens,* but there was also a piece of a blade of grass in tube no. 147. In *P. acaenae* the processus terminalis is shorter, 1—1 1/3 times as long as base of segment V; the siphunculi swell gradually from 0.048 near base to a maximum of 0.065 mm, from where they gradually narrow to 0.035 mm just below the thin flange. The body in *acaenae* is very different in shape, e.g., 1.94 mm long with a greatest width of 1.21 mm.

The sample consisted of 13 apterae and one larva. The latter has smooth hind tibiae. In one aptera the embryos can easily be examined. They have 5 antennal segments, segment III being hairless. The last rostral segment has 4 hairs besides the 3 subapical pairs, and it is distinctly rostrate. The chaetotaxy of the dorsum is not visible.

Types. Holotype: apterous viviparous female (measurements no. 2), from *Poa flabellata,* Falkland Islands, 21.IV.'37, leg. A. G. Bennett. Paratypes: apterae viviparae with collecting data as for holotype. Holotype and most paratypes returned to the British Museum (Natural History); some paratypes in the author's collection.

Thripsaphis Gillette, 1917

Börner (1930, 1952), Quednau (1954), Eastop (1966), and Richards (1971) use a subdivision of what Palmer (1952) has under *Thripsaphis* Gillette. This, in its most recent form by Richards, is as follows:

a. *Thripsaphis* Gillette, 1917, type species *Brachycolus ballii* Gillette, 1908. Empodial hairs spatulate.

b. *Allaphis* Mordvilko, 1921, type species *Callaphis caricicola* Mordvilko, 1914 [1]). Empodial hairs setiform, apterae viviparae without wax glands ("cribriform discs" of Richards, 1971) or with wax glands not visible (Quednau, 1954).

c. *Trichocallis* Börner, 1930, type species *Allaphis caricis* Mordvilko, 1921. Empodial hairs setiform, apterae viviparae with dorsal wax glands.

Eastop (1966) uses *Allaphis* and *Trichocallis* as subgenera of *Thripsaphis*. The subdivision looks clear enough, but there are some objections. The case of *Thripsaphis utahensis* Knowlton & Hall, discussed on p. 149, suggests that the presence or absence of wax glands is not a very good character. But besides, a very close examination of those species the four authors thought to have no wax glands, revealed that these are present, though often only caudo-laterally on abd. tergite VIII, and in dorsal view hardly visible. A more serious objection arises from the accumulation of misidentifications of the type species of *Allaphis* and *Trichocallis*.

Through the kind help of Dr. G. Shaposhnikov, Leningrad, I could remount and examine original material of *"Callaphis" caricis* and *"C." caricola* Mordv., *collected* from Carex in 1907 and labelled by Mordvilko. The results are:

a. *Callaphis caricicola* Mordvilko, 1914, later renamed *Allaphis caricicola* (Mordvilko, 1914) by Mordvilko (1921). Börner (1952) synonymized *Thripsaphis thripsoides* Hille Ris Lambers, 1939 with *caricicola* Mordv. However, this is quite wrong. Actually *Thripsaphis gelrica* Hille Ris Lambers, 1956 is a synonym of *Callaphis caricicola* Mordvilko, 1914, and that is a species with markedly spatulate empodial hairs. Therefore *Callaphis* Mordvilko, 1909, type species *Callaphis caricicola* Mordvilko, 1914, and *Allaphis* Mordvilko. 1921, nomen novum pro *Callaphis* Mordvilko, 1909 nec Walker, 1870, become synonyms of *Thripsaphis* Gillette.

b. *Allaphis caricis* Mordvilko, 1921, the type species of *Trichocallis* Börner. *Thripsaphis thripsoides* Hille Ris Lambers, 1939 is a synonym of *Allaphis caricis* Mordvilko, 1921, and not of *Callaphis caricicola* Mordv., as Börner and later authors thought. *Allaphis caricis* Mordv. is a species with setiform empodial hairs, and, as *Thripsaphis thripsoides* H.R.L. according to Richards (1971), *without* dorsal wax glands in apterae viviparae.

As the presence or absence of wax glands is hardly a sensible character, I recognize only two subgenera, *Thripsaphis* Gilette, 1917, and *Trichocallis* Börner. The fact that Börner (1930, 1952) misidentified *Aphis cyperi* Walker, 1848 with *Allaphis caricis* Mordv., and (1930, p. 165) erroneously synonymized his genus *Trichocallis* erected on p. 127 of the same paper with *Phyllaphoides* Takahashi, fortunately has no consequences. Also *cyperi* Walker has setiform empodial hairs, even if it has very many wax pores on the dorsum.

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[1]) The years of publication of the genus *Callaphis* Mordv. and the species *caricis* Mordv. and *caricicola* Mordv. were dubious. Mordvilko (1921, p. 58) writes "*caricicola* Mordv. (1908)". Börner (1952, p. 282) could not find a reference to the species in Mordvilko's papers of 1908. Neither could I. Börner then writes that Mordvilko (1914, p. 27) first turns up with *Callaphis*, with as single species *C. caricicola* Mordv., in a key to genera. But as Mordvilko treats both genus and species as if they were described earlier by him, I continued the search, and found in a footnote in Mordvilko's (1909) paper on aphid biology on p. 102: "In die Gruppe *Callipterina* bewohnt nur die Gattung *Sipha* Pass. Kräuter und namentlich Gramineen, sowie die Gattung *Callaphis* Mordw. (*caricicola* Mordw. und *caricis* Mordw.) die Blätter von Carex;". Consequently *Callaphis* Mordv. should have 1909 as year of publication; *caricicola* Mordv. remains a nomen nudum till 1914; and *caricis* Mordv. till 1921. when it was described as an *Allaphis*.

In Richards' revision (1971) of the sedge aphids of the world a few species and one genus have not been discussed. He lists *Thripsaphis striata* Bozhko, 1961 as a synonym of *Subsaltusaphis ornata* (Theob.) which is not suggested by the photograph accompanying the description. Dr. Maria Bozhko most kindly made a type available for examination. It appears that *Thripsaphis striata* Bozhko, 1961 belongs in *Neobacillaphis* Huculak, 1968, type species *Neobacillaphis szelegiewiczi* Huculak, 1968, a species and genus not mentioned by Richards. *N. striata* (Bozhko) differs from *N. szelegiewiczi* Huculak by a shorter and broader body with paired, dark, spino-pleural sclerites; an evenly rounded abd. tergite VIII (as in *T. ossiannilssoni* H.R.L.) which has a number of small hairs on its disc as in *N. szelegiewiczi;* by shorter antennae without secondary rhinaria in apterae, with a processus terminalis only half as long as the base of ant. segment VI, with conspicuous, dense transverse rows of spinules from segment III—VI, and with long hairs, mostly longer than the largest diameter of ant. segment III; by having no umbrella-shaped, but inverted-wedge shaped dorsal hairs.

Also *Thripsaphis caricicola* Swain, 1918 is not mentioned by Richards (1971). The type material of this California sedge aphid can not be found. At any rate the name is not available, because it is a junior secondary homonym of *Callaphis caricicola* Mordvilko, 1914.

A number of new members of the subgenus *Trichocallis* are described hereafter. The North American species key as follows:

KEY TO THE NORTH AMERICAN SPECIES OF THE SUBGENUS *Trichocallis*

Apterous viviparous females.

1 (2) Median process on front as long as ant. segments I and II together. *Carex trichocarpa*. Canada.
T. daviaulti Quednau

2 (1) Median frontal process shorter than ant. segments I and II together.

3 (4) Abd. tergite VIII with its caudal margin triangular with slightly convex sides or with a faint process bearing two hairs. Resembles strongly *caricis* Mordv., but differs in pattern of dorsal nodules. Colorado, Quebec.
T. producta Gill.

4 (3) Abd. tergite VIII with caudal margin in the middle rounded or straight or indented.

5 (16) Hind margin of tergite VIII, posterior corners of tergite VII, and often various other places, e.g. around spinal and pleural hairs, and distal parts of antennal segments, with stippled wax pores.

6 (11) Distance between the two middle hairs on posterior margin of abd. tergite VIII only about 9/10—1¼ times as large as the distance from either of those hairs to the nearest marginal hair more basad. Tergite VIII always very evenly rounded, more or less semicircular, often with a number of tiny hairs on its disc. Group of *T. ossiannilssoni* H.R.L.

7 (10) Ant. segment III only about 3½—6½ times as long as its greatest width. Dorsal ornamentation of abdomen consisting of long, wavy, here and there coalescing, rows of very small semi-acute spinules.

8 (9) Disc of abd. tergite VIII with 6—15 mostly very inconspicuous, thin hairs besides the single or partly double row of much larger marginal hairs. Only Europe to Japan.

T. ossiannilssoni H.R.L. sensu stricto

9 (8) Disc of abd. tergite VIII without hairs. California.

T. ossiannilssoni subsp. *pacifica* subsp. nov.

10 (7) Ant. segment III at least 8, mostly 10 or more times as long as its greatest width. Dorsal ornamentation consisting of short rows of 2—4 blunt nodules mixed with half-fused single large nodules up to 0.009 mm in diameter. Probably *T. ossiannilssoni* × *T. subverrucosa,* found with the potential parents. California.

T. hybrida spec. nov.

11 (6) Distance between the two middle hairs on posterior margin of abd. tergite VIII more than 1¼ time as large as the distance from either of those hairs to the nearest marginal hair more basad. Tergite VIII mostly not evenly rounded, either with a blunt angle between sides and rounded apex (or, not as a result of mounting, posterior marginal hairs far from posterior margin of tergite), or with a straight or slightly concave part between the middle hairs on posterior margin.

12 (13) Distance between middle posterior hairs on margin of abd. tergite VIII 2½—3¼ times as large as distance from either of these hairs to the nearest marginal hair more basad. Only posterior angles of tergite VIII with stippled wax glands, none in the middle of posterior margin. Antennae long, up to 3 times as long as width of head across and including the compound eyes. Front with very pronounced median process of 0.065 mm long. California.

T. californica spec. nov.

13 (12) Distance between middle posterior hairs on margin of abd. tergite VIII less than 2 times distance from either of these hairs to nearest marginal hair more basad. A broad zone of stippled wax glands along the margin of tergite VIII, also in the middle. Median frontal process not exceeding 0.055 mm.

14 (15) Row of hairs along posterior margin of abd. tergite VIII placed up to their length inwards from posterior margin of that tergite. Dorsal ornamentation virtually absent. More than posterior half of tergite VIII covered with stippled wax glands. Large fields of stippled wax glands around the marginal, pleural and spinal hairs of thorax and abd. tergites I—VII. Many States in North America; Europe.

T. cyperi (Wlk.) sensu latiore

15 (14) Row of hairs along posterior margin of abd. tergite VIII arranged on, or very nearly on, that margin. Dorsal ornamentation very conspicuous, consisting of short rows of 2—4 subacute spinules suggesting imbrication. Along the the median line stippled wax glands on abd. tergite VIII only on posterior 1/4—1/3 of the segment. Fields around spinal hairs on abd. tergites I—VI consisting of 0—10 glands. Utah.

T. utahensis Knowlton & Hall

16 (5) No wax glands visible or only a few on abd. tergite VIII.

17 (18) The 10—16 hairs on abd. tergite VIII thin, only about 0.015—0.030 mm

long. Dorsal ornamentation on abd. tergites II—V consisting of rather sharp, small spinules, often in short rows of 2—5, but distance between rows, or between isolated spinules at least 3 times diameter of spinule. Tergite at posterior margin not indented in the middle. Idaho, California.
T. scabra spec nov.

18 (17) The 6—10, mostly 8, hairs on abd. tergite VIII stout and stiff, the longest of the set 0.050—0.085 mm long, when rather short often somewhat blunted. Dorsal ornamentation on abd. tergites I—III mostly consisting of more or less flat, partly strongly transversely oval warts which may measure 0.010 mm in one direction, and which are not farther apart than their greatest length. Tergite VIII on posterior margin somewhat depressed or indented in the middle. Many North American States, also Europe.
T. verrucosa Gill. sensu latiore

Thripsaphis (Trichocallis) californica spec. nov.

Apterous viviparous female.

In life very pale yellowish white with glassy, transparent margins, more or less shiny; antennae dark; legs glassy. In mounted specimens body about 2.20—2.70 mm long, maximum width about 0.37 of length, pale with in the darkest specimens a faint browning along the very margin of abdomen, especially on abd. tergites VII and VIII, and with more distinct very thin, brownish intersegmental transverse lines. Spinal hairs on abd. tergite III 0.008—0.010 mm long; marginal hairs to 0.016 mm long; the 8—10 marginal, medium-thin, hairs on tergite VIII to 0.040 mm long, with middle posterior pair about 2½—3¼ times as far apart as distance to nearest more lateral hair. Stippled poriform wax glands clearly visible in the darkest specimens on their marginal pigmented areas, from tergites III to VIII; on the more anterior of these tergites around the marginal hairs; in quite pale specimens at most visible on tergite VIII, but rather frequently not visible, also because they may be on the edge of the body; legs and antennae apparently without wax glands. Integumentum on mid-dorsum with irregularly arranged, rather pointed nodules, shorter than their basal width of about 0.002 mm, in transverse direction about 3—4 times their own width apart, but in longitudinal direction much further apart; marginally these nodules are nearly absent, but where present they appear to be inclined caudad; from tergite VI caudad the nodules change to very short spinules in transverse rows of 2—3 on tergite VI, 2—7 on tergite VIII which looks spinulosely imbricated. Head with a median band of small blunt nodules which, more laterally, are much flatter, blunt, more disperse, and hardly visible. Front strongly, downwards, protruding with a rounded median process as long as ant. segment II with 2 pairs of hairs of about 0.035 mm long. Antennae 3/5—2/3 of length of body, with segments I, II, and about basal 1/3—1/2 of III pale, rest dark brown; flagellum with spinules on the straight, fine, imbrications; segment III without rhinaria, much longer than segment VI, with some 12—16 straight, acute hairs up to 3/5 as long as diameter of segment at its constricted base, about 14—17 times as long as its largest width. Rostrum reaching to half-way middle coxae; last segment half as long as second joint of hind tarsi, with 2 hairs besides the 3 subapical pairs. Legs as pale as body with only the second tarsal joints infuscated; tibiae to near base inconspicuously spinulose except ventrally, hind tibiae between 2/7 and 1/3 of length of body; apical tibial hairs not differentiated; first tarsal joints very spinulose, with 5 ventral hairs; second tarsal joints 1/5 of length of hind tibia; empodial hairs fine. Porus of siphunculi about 0.035 mm in diameter, hardly raised. Tergite VIII roughly in the shape of a rectangle with sides of 0.065 and 0.035 mm of which the upper corners are replaced by quarter circles with a radius of half the short side; sides slightly convex, posterior margin faintly convex; disc without hairs. Cauda knobbed, the knob distinctly longer than wide, with 13—16 short hairs.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Cau.
1	2.66	1.72	0.52	0.34	0.33	0.18 + 0.19	0.15
2	2.34	1.60	0.48	0.31	0.31	0.18 + 0.16	0.12
3	2.63	1.74	0.53	0.36	0.32	0.18 + 0.18	0.13
4	2.67	1.77	0.53	0.35	0.33	0.19 + 0.18	0.13
5	2.55	1.57	0.47	0.31	0.30	0.17 + 0.16	0.12
6	2.63	1.65	0.48	0.34	0.32	0.18 + 0.17	0.14

(1—6, from *Carex* sp., Inverness, Point Reyes, California, U.S.A., 22.II.'64, leg. D.H.R.L. no. 148).

Discussion. The species might easily be mistaken for *Thripsaphis verrucosa* Gill. without rhinaria on ant. segment III, but the structure of abd. tergite VIII is quite different. In only a few specimens, the more pigmented ones, the wax glands are quite distinct.

Because the presence or absence of wax glands is such an unreliable character, I have made an effort to find other discriminants, such as chaetotaxy and the fine sculpture of the integumentum, for species of this genus. Quite good slides are needed for studying the sculpture of the integumentum.

The *Carex* on which this species occurred was a tall species with leaves of over 10 mm wide, growing in a ditch. It was thought to be *C. comosa,* but inflorescences were not available.

Types. Holotype: apterous viviparous female (measurements no. 6) from *Carex? comosa,* Inverness, Point Reyes peninsula, California, U.S.A., 22.II.'64, leg. D.H.R.L. no. 148. Paratypes: apterae viviparae with collecting data as for holotype.

Thripsaphis (Trichocallis) cyperi (Walker, 1848)

The most characteristic features of this species are the following: the marginal hairs on abd. tergite VIII stand far inwards from the posterior margin of that tergite, there are no hairs on the disc of this tergite, the antennae in adult apterae have secondary rhinaria, and the empodial hairs are not spatulate but setaceous. *T. caricicola* (Mordv.) is very similar, has the same exceptional arrangement of marginal hairs on abd. tergite VIII, but has, in all specimens studied, some extra hairs on the disc of that tergite, has no secondary rhinaria on the antennae in apterae, and spatulate empodial hairs. *T. cyperi* is widely distributed in the Nearctic and Palaearctic, but *T. caricicola* is only known from the Palaearctic Region.

T. vibei H.R.L., 1952, which has the hairs on abd. tergite VIII arranged as in

T. cyperi, was described from Greenland, where also a form with longer antennae occurs. Richards (1971) has listed *T. vibei* as a synonym of *T. cyperi,* but does not mention for which reason. Because *T. vibei* does not show the very elongate shape of *T. cyperi,* and has rather shorter antennae, it can easily be distinguished. In *T. vibei* the flagellum of the antennae in apterae is 0.9—1.0 times the greatest width of the body. In *T. cyperi* the flagellum is 1.4—1.8 times as long as the greatest width of the much more elongate body, depending on the degree of flattening of the body through mounting. *T. cyperi* subsp. *arctica* H.R.L., 1955, agrees with *T. cyperi* as to shape of body, but the absolutely shorter antennae are more like those of *T. vibei,* and therefore I (1960) treated it as a subspec. of *T. vibei.* In this subspecies the flagellum of the antennae in apterae is 1.15—1.25 times as long as the greatest width of the body.

As yet *T. vibei* is only known from two good samples from Greenland, *T. vibei* subspec. *arctica* H.R.L. from one sample from Greenland, and seven samples from Iceland; it produces sexuals in Greenland at the end of July, in Iceland in the beginning of August. *T. cyperi* is known from the more northern States of U.S.A., e.g., Minnesota, and in a broad belt across Canada at least as far north as Labrador, in Europe from west to east reaching to the north as far as Northern Sweden, and to the south into the Alps; as far as known its sexuals are produced in the autumn.

Thripsaphis (Trichocallis) hybrida spec. nov.

Apterous viviparous female.

Colour in life not known. In mounted specimens body 2.20—2.45 mm long, about 3 times as long as its largest width; seemingly evenly pale, with abd. tergite VII posteriolaterally, and tergite VIII marginally and caudally smoky brown, but actually colourless intersegmental lines between segments posteriorly bordered by pale brown visible on abdomen. Tergum densely covered with flat-topped, small, oval warts of up to 0.006 mm in the longest, transverse axis, and these warts very often divided in two equal parts; laterally warts much smaller and even pointed, and on tergites VII and VIII also medially passing into spinulose imbrications; the ornamentation much as in *T. verrucosa* Gill., but warts smaller. Dorsal hairs on tergite III about as long as the width of the nearest wart, cephalad of the siphunculi marginally not longer, but tergite VII (and mostly VI, sometimes V) marginally with stout, sharp hairs of 0.030—0.055 mm; tergite VIII, only marginally, with 8—11 slightly longer, stout hairs of which the middle posterior pair stands not or hardly farther apart than the other hairs; no hairs on the disc of tergite VIII. Wax glands indistinctly present on posterior margin of tergite VIII. Head with small, blunt nodules; front strongly protruding but not quite as far as the length of ant. segment II, with 2 stoutish sharp or blunt hairs 0.040—0.045 mm long; more laterally and caudad two shorter hairs on low processes. Antennae with segments I, II and basal part of III pale, rest dark brownish; flagellum imbricated with very short spinules on the imbrications; segment III about 9—12 times as long as its largest width, without rhinaria and glands, just longer than segment VI, with 6—9 hairs up to half as long as diameter of segment at its constricted base. Rostrum not nearly reaching middle coxae; apical segment about half as long as second joint of hind tarsi, with 2 short hairs besides the 3 subapical pairs. Legs pale, with tarsi distad brownish; tibiae especially dorsally spinulose from base to apex; hind tibiae ¼ of length of body; apical tibial hairs not differentiated; first tarsal joints with 5 ventral hairs; second joints less than ¼ of length of hind tibiae; empodial hairs setaceous. Siphunculi slightly elevated, on the margin of tergite VI which is densely covered with small, just blunt, nodules. Tergite VIII semicircular to semioval, evenly rounded also on posterior margin, about 4/7 times as long as its basal width, with anterior middle portion pale, rest dark smoky brown. Cauda pale, the knob trapezoid, as long as wide, with 14—16 short hairs.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Cau.
1	2.44	1.14	0.32	0.19	0.19	0.13 + 0.14	0.12
2	2.21	0.97	0.27	0.16	0.15	0.12 + 0.12	0.11

(1—2, from *Carex* sp., Wheeler Springs (Ventura Co.), California, U.S.A., 19.V.'61, leg. R. van den Bosch, no. 61—V—19 r).

Discussion. The two specimens of *T. hybrida* were part of a rather large sample, no. 61—V—19 r, collected by Dr. R. van den Bosch. In the sample the following different apterous forms could be distinguished.

1. *T. ossiannilssoni pacifica*, described on p. 145.
2. *T. verrucosa* Gill., one quite typical specimen with rather large, flat warts from pronotum to abd. tergite VI, a distinct flat furrow between two scabrous protuberances on the posterior margin of abd. tergite VIII, and some rhinaria on segment III of the long antennae.
3. *T. hybrida,* two specimens with small warts mostly in pairs suggesting small transversely oval warts, an evenly rounded tergite VIII with traces of stippled wax glands on N.E. and N.W. part near the margin, and short antennae without secondary rhinaria.
4. Specimens with the dorsal ornamentation exactly as in *T. hybrida,* but with abdominal tergite VIII rather as in *T. verrucosa,* with the flat furrow in the middle of posterior margin, and the two stout hairs beside it on a scabrous, very little pronounced, elevation; antennae without secondary rhinaria.
5. Specimens much like no. 4, but covered with very small nodules in transverse rows, seemingly without a trace of warts, except on the middle of mesonotum where they appear to be subdivided. Antennae without secondary rhinaria.

I should add that in nos. 2—5 the hairs on tergite VIII are all stout as in typical *T. verrucosa.*

One wonders what happened on this plant. Are these various types the products of hybridization? With that in mind I proposed the name *T. hybrida* for no. 3. They are like an intermediate hybrid between *T. ossiannilssoni,* and nos. 4 and 5, which I describe on p. 151 as *T. verrucosa subverrucosa* subspec. nov.

It should be emphasized that the differences in the structure of abd. tergite VIII are not artifacts. All the specimens were remounted and regained their shape completely in water, and kept it subsequently in rather thick slides.

Types. Holotype: apterous viviparous female (measurements no. 1), from *Carex* sp., Wheeler Springs (Ventura Co.), California, U.S.A., 19.V.'61, leg. R. van den Bosch no. 61—V—19 r. Paratype: aptera vivipara with collecting data as for holotype.

Thripsaphis (Trichocallis) ossiannilssoni pacifica subsp. nov.

Apterous viviparous female (from one specimen).

Colour in life not known. In mounted specimen body about 3 times as long as its greatest width; head pale; thorax laterally with smoky, sclerotic areas; abdomen with caudad larger and darker marginal sclerites on each segment, and with very vague, paired, widely separated, short, spino-pleural sclerotic bars which on tergite VII are fused to one bar, and very nearly so on tergites V and VI; sclerotisation slightly more distinctly pigmented on posterior tergites; tergite VIII about as dark as marginal sclerites on tergite VII. Hairs on dorsum very short, spinally on tergite III about 0.004 mm long, marginally about 0.009 mm; tergite VIII only along its margin with 12 much stouter, acute hairs 0.030—0.065 mm long, but no hairs on its disc. Wax glands of the stippled pore variety only visible around the marginal hairs of abd. tergites I—VI, over most of the marginal sclerites of tergite VII and on most of tergite VIII except the middle anterior part; I cannot find them on antennae or legs. Dorsum only distinctly spinulose where it is pigmented, the spinules very small, not longer than wide at base, and rather blunt, in rather short rows, rather far apart. Head seemingly smooth because it is pale; front protruding about as far as ant. segment II is long. Antennae darker than head; segment III about 6½ times as long as its maximum width, without rhinaria; segment VI considerably longer than III; flagellum faintly imbricated with rather inconspicuous and widely spaced spinules on the imbrications; longest of the very few hairs on segment III half as long as diameter of segment at its much constricted base. Rostrum reaching the middle coxae; last segment with 2 hairs besides the 3 subapical pairs, about 4/7 of second joint of hind tarsi. Legs rather short, pale with bases of tibiae slightly darker than apices; tibiae on distal half slightly spinulose, very faintly so dorsally on basal half; hind tibiae about ¼ length of body; apical tibial hairs not differentiated; first tarsal joints with 5 ventral hairs; second joints about ¼ the length of the corresponding tibiae; empodial hairs fine, setaceous. Siphunculi nearly poriform, not measurably elevated, on the marginal sclerite of abd. tergite VI. Tergite VIII semicircular, caudally hardly flattened. Cauda with strongly transverse knob, with 13 rather short hairs.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Cau.
1	1.74	0.76	0.17	0.12	0.13	0.12 + 0.11	0.08

(1, from *Carex,* Wheeler Springs (Ventura Co.), California, U.S.A., 19.V.'61, leg. R. van den Bosch 61—V—19 r).

Discussion. *Thripsaphis ossiannilssoni* H.R.L. is now known from the Netherlands to Japan (Higuchi, 1972), and specimens from various European countries hardly differ from Japanese material. All have a number of often very inconspicuous hairs on the disc of abd. tergite VIII besides the much longer and thicker hairs along the margin. Mostly one sees only the bases of these hairs as perforations in the dark tergite. However, in the Californian specimen there is no trace of such hairs.

T. ossiannilssoni can easily be recognized with the key on p. 139—141.

Type. Holotype: apterous viviparous female, from *Carex* sp., Wheeler Springs (Ventura Co.), California, U.S.A., 19.V.'61, leg. R. van den Bosch no. 61—V—19 r.

Thripsaphis (Trichocallis) producta Gillette, 1917

Under this name Gillette (1917) and Palmer (1952) very clearly described, or figured part of, the species which Richards (1971) described as *Allaphis thripsoides* Hille Ris Lambers. Under *Allaphis thripsoides,* Richards writes that *Thripsaphis foxtonensis* Cottier, 1953, is a synonym and he quotes also Eastop (1966) in this context. Eastop, however, separated the two species. They are closely related but totally different. The types Dr. Cottier gave me show in the apterae antennae of 1.80 mm long, fully twice as long as in average *thripsoides* = *caricis* Mordv., and nearly reaching to abd. tergite VI. Also the alatae are very different, by having broad, black sclerotic, quite free bars across the abdomen instead of a solid sclerite like *T. caricis* Mordv. This is clearly shown in Cottier's figures.

The confusion about *T. producta* appears to be that the type-specimen in the U.S. National Museum does not agree with the original and Palmer's (1952) description. [1]) This is not very surprising. Not until 1932 did Gillette and Palmer mention types for their species, and the unfortunate mix-up with *T. ballii* is clearly shown in Gillette & Palmer (1931) where the VIIIth abdominal tergite of *ballii* is drawn over the caption *T. producta.*

American *T. producta* is not the same as European *T. caricis,* though the two are extremely alike. There is a consistent difference in the pattern of the nodules on the abdominal tergum. In *T. caricis* they are small on the middle of the body, often subacute, and invariably arranged in somewhat wavy, often coalescing, very long transverse rows. In *T. producta* from America the nodules are larger and if there are rows, they consist of 2—3 nodules.

T. thripsoides = *caricis,* and *T. producta* are said by Eastop (1966), and consequently Richards (1971), to have no wax glands, or cribriform discs. They are clearly visible in specimens, especially near-adult larvae and apterae viviparae, with a dark eighth abd. tergite, along its sides, and in larvae also on the marginal sclerites. In pale adults they are invisible.

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[1]) The type slide, borrowed from the U.S. National Museum, Washington, D.C., (Cat. no. 41948) contains an alate and an aptera vivipara both indicated as type, and an alate indicated as paratype. All are indeed *Thripsaphis ballii* (Gillette) as stated by Richards (1971) and confirmed by Quednau. It has very clearly been relabelled in the handwriting of ? C. P. Gillette. Under the right - hand label is another label on which the original name, which I could not read, is obliterated by a narrow strip of paper on which the name "T. producta n. sp." is written. The specimens were found "on Carex sp. / 6-3-1915 / Ft. Collins, Colo. / Coll. L. C. Bragg / Colo. Agr. Exp. Sta. /Ac. 1005". Another slide labelled metatype, with one label "Thripsaphis / producta n. sp. / on Carex / 8.17.07 / Ft. Collins, Colo / C. P. G. Coll", contains 6 apterae viviparae and two larvae which are in excellent condition and agree with the original description. It is quite clear that an error in labelling has been made when about 1932 types were indicated by C. P. Gillette and/or M. A. Palmer.

I made a formal proposal to the International Commission on Zoological Nomenclature to approve the designation of a lectotype of *Thripsaphis producta* Gill. that agrees with the original description.

It is the lowest specimen on the right, on slide: U.S. Nat. Museum no. 73040, labelled on the left: "Thripsaphis / producta / Gilette, 1917 / lectotype (at arrow) / and paratypes / D. Hille Ris Lambers, 1973". On the right labelled as mentioned above for the metatype.

Thripsaphis (Trichocallis) scabra spec. nov.

Apterous viviparous female.

Colour in life not known. In mounted specimens body evenly yellowish, 2.40—2.90 mm long, about 2½ times as long as its maximum width which is on the posterior third of the body. Spinal hairs on abd. segment III thick, inconspicuous, about 0.007 mm long, marginal hairs 0.009 mm, all sharply curved backwards; the 11—16 hairs on tergite VIII mostly strongly curved near the middle, the longest (median posterior pair) 0.022—0.034 mm long, the shortest 0.013 mm long; often a few hairs on tergite VIII far from its margin; distance between the median posterior pair about 0.065—0.070 mm, to the nearest hair 0.040—0.065 mm. No traces of wax glands visible on any part of the body. Integumentum densely covered with mostly rather blunt nodules, on middle of mesonotum with basal width of about 0.004 mm, at mutual distances of 0.007—0.010 mm; more caudad these nodules smaller, subdivided and more acute, in rows of 2—3; on tergite VI acute and in rows of 2—4; on tergite VIII very small, in long wavy transverse lines of 10—30 spinules, but larger and in short rows on the margins of that segment. Head with a very broad median band of small nodules, and more inconspicuous, scattered ones more laterally. Front with a large median bulge, which protrudes about as much as the length of ant. segment II; this bulge not a marked process, in the middle with 2 pairs of hairs of about 0.030—0.035 mm, one above the other, but sometimes below the upper pair an extra pair of hairs half as long. Antennae 3/5—7/10 of length of body, with segments I, II and basal 1/2—2/3 part of segment III pale, the rest dark brown to black; flagellum faintly imbricated and imbrication more or less denticulate, not spinulose on segments III—V, but on VI very indistinctly spinulose; in specimens from Idaho with 0—1 rhinarium (5 segments with together 1 rhinarium), in specimens from California with 1—3 always quite small and inconspicuous rhinaria on III, half-way or past middle of segment; segment 14—18 times as long as its largest width, with 16—20 small hairs up to 2/5 of diameter at its constricted base. Rostrum unusually short, not reaching mesosternum, last segment triangular with slightly convex sides, acute, only 1/3—3/8 of length of second joint of hind tarsi, with 2 hairs besides the 3 subapical pairs. Legs faintly tinged; tibiae over about ¾ of their length only somewhat spinulose on dorsal surface and also near apex with rather few spinules; hind tibiae about ¼ of

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Rhin. on III	Cau.
1	2.62	1.54	0.50	0.27	0.27	0.16 + 0.17	1 & 2	0.12
2	2.57	1.88	0.57	0.37	0.34	0.20 + 0.19	1 & 1	0.12
3	2.47	1.68	0.55	0.31	0.29	0.18 + 0.18	1 & 2	0.12
4	2.79	1.57	0.52	0.31	0.26	0.15 + 0.17	2 & 3	0.13
5	2.68	1.58	0.52	0.30	0.27	0.16 + 0.17	1 & 1	?
6	2.55	1.54	0.51	0.29	0.26	0.16 + 0.16	0 & 0	0.12

(1—5, from *Carex* sp., U. C. Sagehen Creek (Sierra Co.), California, U.S.A., 18.VII.'67, leg. D. Calvert no. C 67—7—18 a; 6, from "grass", Cascade, Idaho, U.S.A., 18.VI.'54, leg. G. F. Knowlton no. 495).

length of body, their apical hairs not differentiated; first tarsal joints normally spinulose, with 5 ventral hairs; second tarsal joints of hind legs ¼ of length of hind tibiae; empodial hairs setaceous. Porus of siphunculi about 0.040 mm wide, hardly raised. Tergite VIII in the shape of a rectangular triangle with hardly convex sides the top of which is replaced by a circle with the length of the segment as radius; length 0.45 times base; posterior margin evenly curved, not indented in the middle. Cauda with the knob 1.1 times as wide as long, rather evenly rounded, with 12—14 hairs.

Alate viviparous female.

Colour in life not known. In mounted specimen body about 2.15—2.50 mm long, elongate; head laterally blackish brown with a pale median stripe and a pale brownish area mesad of each eye; thorax unevenly dark, abdomen with large, dark brown marginal sclerites and with broad, paler brownish spino-pleural cross-bars on each tergite; the bars are narrower laterally, tend to fade or disappear in the middle on tergites I—III, are fused with marginal sclerites only on tergites VI and VII, sometimes V, and may be fragmentary on tergites I—III; tergite VIII evenly dark brown. Mesonotum with small, very elongated nodules, but sclerites on abdomen only with long, wavy lines of small, blunt spinules. Bulge on front lower than in apterae. Antennae 3/4—4/5 of length of body, blackish, with the very base of segment III paler, with only processus terminalis very indistinctly spinulose; segment III with 9—11 ciliate, larger and smaller rhinaria more or less in one row, larger ones transversely oval, distal 1/6—1/5 part without rhinaria. Fore wings long and narrow, with thick brown veins; sector radii very short, sometimes hardly developed, very little curved; radial cell not or hardly wider than stigma. Legs brown to dark brown, rather slender. Knob of cauda brownish black. Other characters as in apterous viviparous females.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Rhin. on III	Cau.
1	2.15	1.56	0.52	0.33	0.27	0.14 + 0.16	9 & ?	0.12
2	2.47	1.91	0.65	0.36	0.33	0.18 + 0.21	10 & 11	0.12
3	2.30	1.88	0.64	0.36	0.33	0.19 + 0.18	10 & 10	0.12

(1—3, from *Carex* sp., U. C. Sagehen Creek (Sierra Co.), California, U.S.A., 18.VII.'67, leg. D. Calvert no. C 67—7—18 a).

Embryos. Marginal hairs spiny, from 0.016 mm on abd. segment III to 0.030 mm on segment VII. Spinal and pleural hairs smaller, from 0.006, to 0.012 on tergite VII; hairs on tergite VIII about 0.040 mm long.

Discussion. One sample of 5 good apterae and 4 alatae, one without head, is available from California, and a sample of 4 much damaged apterae from Idaho. The samples differ very little except in the number of rhinaria in the apterae. The California sample was mixed with *Thripsaphis verrucosa* Gill., of which one aptera and one alata was present. This made it possible to decide that the differences between the two highly similar species were not caused bij eco-factors. But something else may cause confusion. In the bodies of these aphids one may find larvae of hymenopterous parasites with a very warty skin similar to that of *T. verrucosa,* but with the warts more closely packed. Such a larva in *T. scabra* might lead to misidentification. Then the different shape of abd. tergite VIII or the much less reliable shape of the front could help.

Alatae of both species have more pronounced differences in frontal structures, but also the sculpture on the sclerotic parts of the abdomen is very different. On tergites II—V this consists pleurally in *verrucosa* of transversely oval warts with 2—4 blunt, dark spinules on their posterior margin but in *T. scabra* there are only rows of 3—7 spinules.

It is doubtful whether the curious shape of the sector radii is a good discriminant. The veins in this sample show often some extra forks, and therefore the shape of the sector radii might be teratological.

Types. Holotype: apterous viviparous female (no. 1 of measurements), from *Carex* sp., Univ. of Calif. Sagehen Creek (Sierra Co.), California, U.S.A., 18.VII.'67, leg. D. Calvert, no. C 67—7—18 a. Paratypes: apterous and alate viviparous females with collecting data as for holotype; apterae viviparae (damaged), from "grass", Cascade, Idaho, U.S.A., 18.VI.'54, leg. G. F. Knowlton.

Thripsaphis (Trichocallis) utahensis Knowlton & Hall, 1950

Richards (1971) classifies this species as an *Allaphis* Mordvilko, which in Richards' sense is "without clusters of wax pores". Through the kindness of Dr. Louise M. Russell I could borrow the type slide from the U.S. National Museum, Washington, D.C. This contains three remounted specimens: one adult apterous viviparous female, one alatoid nymph, and one alate viviparous female. The aptera, which I choose as lectotype, and the alatoid nymph have large fields of wax glands on abd. tergite VIII, around the posterior spinal hairs and marginally on abdomen. A slide marked "Paratypes IV", from: grass sweeps, Logan, Utah, 15.V.'43, borrowed from the U.S. Nat. Museum, contains two apterae viviparae in which the wax glands are also quite distinct although these specimens are still in balsam.

Thripsaphis (Trichocallis) verrucosa Gillette, 1917

The published descriptions seem to cover three taxa which are treated as subspecies. They key as follows:

1 (2) In apterae legs and antennae dark to blackish brown, and also body conspicuously brown with a pale median stripe, and dark brown intersegmental transverse lines. Tergum evenly covered with semiglobular or slightly transverse nodules, little larger than the socket of a dorsal hair, but taller. Ant. segment III with rhinaria. In alate mesonotal lobes with randomly arranged, nearly round nodules. On *Carex.* Labrador and Alaska. *T. verrucosa nodulosa* subspec. nov.

2 (1) In apterae legs pale, antennae with at least segments I and II and a basal portion of segment III pale. Ornamentation of tergum of a different kind. Ant. segment III with or without rhinaria.

3 (4) In apterae ant. segment III without rhinaria in all available samples. Antennae about half as long as body or shorter. Integumentum on mesonotum to abd. tergite III sometimes with large, quite flat, transversely oval or eye-shaped warts

but mostly subdivided into 1—3 nodules on their posterior half, caudally and medially soon splitting into pairs or triplets of small warts; undivided larger warts at least in one direction farther apart than their own longest axis; on margin of body warts rather acute and all inclined caudad. Sclerotic bars on abdomen of alate ornamented with rows of tiny, acute spinules not on the posterior margin of flat scales. S.W. California.
T. verrucosa subverrucosa subspec. nov.

4 (3) In available material at least one ant. segment III with one or more rhinaria on distal half. Antennae rarely half as long as body, usually considerably longer. Integumentum from pronotum to about abd. tergite VI in the middle covered with eye-shaped or strongly transversely oval, never subdivided, very flat warts, which stand at most as far apart as their shortest axis, while their longest axis is about as long as the dorsal hairs on these tergites. On more posterior tergites spinules appear on the posterior margin of the warts. Alatae on mesonotal lobes with oblique rows of strongly oval nodules, on the sclerotic bars of abdomen with transverse oval warts bearing small spinules on posterior half (Photograph 10 b, p. 14 in Richards, 1971). All European material, and samples from Colorado, Utah, California and Quebec. May occur mixed with the preceding subspecies. (*T. leporinae* Börner).
T. verrucosa verrucosa Gill.

Thripsaphis verrucosa nodulosa subsp. nov.

Apterous viviparous female.

Colour in life not known. In mounted specimens body 2.45—2.85 mm long, spindle-shaped, with largest width at abd. segment I at about the middle of the body, conspicuously brown with a pale median stripe from head to tergite VI, VII or VIII, with interrupted, pale, membraneous, intersegmental lines, bordered caudad by narrow, dark brown lines across the abdomen. For dorsal ornamentation see key to subspecies. Median depression on posterior margin of abd. tergite VIII distinct, but the scabrous processes on both sides very low. In those specimens in which tergite VIII is slightly elevated, distinct wax glands or cribriform discs visible at the level of the marginal hairs, especially distinct in no. 4 in the table below. Antennae dark brown to black with only the very base of segment III pale; segment III with many more rhinaria than in the main species. Legs dark brown to brownish black, only seemingly not much spinulose. Other characters more or less as in *T. verrucosa* sensu stricto.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Rhin. on III	Cau.
1	2.60	1.43	0.47	0.27	0.21	0.15 + 0.13	5 & 7	0.15
2	2.63	1.47	0.46	0.28	0.23	0.16 + 0.15	6 & 6	0.15
3	2.64	1.40	0.47	0.26	0.19	0.17 + 0.15	4 & 6	0.15
4	2.54	1.39	0.47	0.27	0.21	0.15 + 0.13	7 & 7	0.15
5	2.69	1.67	0.57	0.33	0.29	0.16 + 0.15	6 & 7	0.15
6	2.78	1.66	0.56	0.30	0.29	0.18 + 0.15	5 & 6	0.15

(1—4, "Emergent vegetation", S. Carter Basin (Labrador), Canada, 5.VIII.'58, leg. B.S.E.S., British Museum no. 1958—490; 5—6, from *Carex* sp., Juneau, Alaska, U.S.A., 26.VII.'61, leg. F. C. Hottes no. 10).

Alate viviparous female.

Colour in life not known. Material in very poor condition, but clearly as dark as apterae. Ant. segment III with 13—17 rhinaria.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Rhin. on III	Cau.
1	2.90	?	0.77	0.38	0.32	0.18 + ?	17 & ?	0.16

(from *Carex* sp., Juneau, Alaska, U.S.A., 26.VII.'61, leg. F. C. Hottes no. 10).

Discussion. The two samples of the subspecies are very much alike, but differ considerably from all other material of *T. verrucosa.* Both come from rather far north, and they could be modifications by low temperature. Yet they grew up during the hottest part of the year, and they are much darker than samples that grew up early at high altitude. The Alaska sample, from July, has one apterous male. This suggests that production of this sex is not induced by short day and low temperature in this subspecies. In European and Colorado populations of the main species sexuals are produced in late autumn.

The discovery of wax glands on abd. tergite VIII in viviparae of this subspecies with its dark tergites suggest that these glands may well be present in the other, pale subspecies. Even in dark forms they are very inconspicuous because in "good" preparations, with a quite horizontal tergite VIII, they are in the plane of the optical axis.

Types. Holotype: apterous viviparous female (measurements no. 1), in "emergent vegetation", S. Carter Basin, Labrador, Canada, 5.VIII.'58, leg. B.S.E.S., British Museum no. 1958—490; paratypes: apterous viviparous females with collecting data as for holotype; apterae viviparae, two damaged alate viviparae and one apterous male, from *Carex* sp., Juneau, Alaska, U.S.A., 26.VII.'61, leg. F. C. Hottes no. 10. Holotype deposited in British Museum (Nat. Hist.) where also most paratypes from the same sample are.

Thripsaphis verrucosa subverrucosa subsp. nov.

Apterous viviparous female.

Colour in life not known. Mounted specimens 1.90—2.50 mm long, elongate spindle-shaped with largest width mostly at metanotum, faintly brownish-yellow with narrow, light brown, pleural intersegmental transverse lines, marginally slightly darker because of the nodules in profile. For dorsal ornamentation see key to subspecies. Median furrow on posterior margin of tergite VIII not very distinct. Antennae with at least segments I, II and basal half of III pale, the rest brownish black. Legs coloured like the body; tibiae conspicuously spinulose till base, except on the caudal side of the base. Other characters as in *T. verrucosa* sensu stricto.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Cau.
1	2.44	1.24	0.38	0.23	0.20	0.15 + 0.14	0.11
2	1.97	0.99	0.27	0.17	0.17	0.14 + 0.13	0.10
3	2.00	1.00	0.30	0.16	0.17	0.13 + 0.13	0.10
4	2.27	1.15	0.34	0.21	0.18	0.14 + 0.15	0.11
5	2.01	1.09	0.32	0.19	0.17	0.14 + 0.14	0.10
6	2.37	1.13	0.33	0.20	0.17	0.16 + 0.13	0.11
7	2.36	1.13	0.33	0.20	0.18	0.15 + 0.13	0.11
8	2.45	1.04	0.32	0.17	0.16	0.15 + 0.12	0.11

(All from *Carex* sp., California, U.S.A., 19.V.'61, leg. R. van den Bosch; 1—2, Wheeler Springs (Ventura Co.), no. 61—V—19 r; 3—4 Matilija (Ventura Co.), no. 61—V—19 s; 5—8, Gorman (Los Angeles Co.), no. 61—V—19 t).

Alate viviparous female.

Colour in life not known. For ornamentation of abdomen see key. Lobes of mesonotum not well visible but with oblique rows of rather dispersed spinules besides an indistinct pattern of broad oblique striae. Other characters as in *T. verrucosa* sensu stricto.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Rhin. on III	Cau.
1	2.19	1.53	0.49	0.31	0.25	0.17 + 0.17	8 & 11	0.11

(with apt. viv. fem. nos. 1—2).

Discussion. Dr. van den Bosch was after hymenopterous parasites of *Carex* aphids, and in one trip collected in three places, probably on the same *Carex*. The Wheeler Springs sample was a mixture of *T. verrucosa* sensu stricto, the subspecies described above, a species described in this paper as *T. hybrida*, and one *T. ossiannilssoni*. The other samples are quite homogeneous.

The absence of rhinaria in all the apterae made me think that perhaps the specimens were fundatrices of *T. verrucosa* sensu stricto. That, however, is not so likely because there was also an alate, which clearly belongs with the apterae.

The subspecies is not a typical California form of *verrucosa* in as much that also quite normal *verrucosa* from several other localities, and even from Wheeler Springs, are available.

Types. Holotype: apterous viviparous female (measurements no. 6) from *Carex* sp., 3 miles S.E. of Gorman (Los Angeles Co.), California, U.S.A., 19.V.'61, leg. R. van den Bosch no. 61—V—19 t. Paratypes: apterae viviparae with collecting data as for holotype; apterous viviparae and one alate viviparous female with collecting data as mentioned under measurements 1—4.

Uroleucon sijpkensi spec. nov.

Apterous viviparous female.

Colour in life brown, with black siphunculi, pale cauda, pale legs, and pale antennae with dark apices. In mounted specimens body 2.80—3.35 mm long, broadly spindle-shaped. Dorsal hairs stiff, with spear-shaped apices, spinally on abd. tergite III to 0.065 mm long, on tergite VIII slightly longer, nearly all placed on brown scleroites up to 0.050 mm in diameter; no trace of an antesiphuncular sclerite present, but postsiphuncular sclerites well developed; tergite VIII with 4 hairs. Marginal tubercles on abd. tergites II—IV mostly present, dark, and smaller and flatter than the socket of a dorsal hair, hardly visible on a small sclerite between two marginal hairs. Head light brown, smooth. Frontal tubercles strongly diverging; depth of frontal furrow just over ¼ of distance between antennal bases. Antennae considerably longer than body; segment I slightly darker than head; segment II as dark as head; segment III with part bearing rhinaria darker to very much darker than head, basal and apical part conspicuously paler, the very apex dark brown to blackish, with 17—36 faintly protruding rhinaria of very variable size, with bulging membranes, mainly along one side over basal 4/7—2/3 part of segment; segment IV basally about as pale or dark as distal part of segment III, apicad darker, to brownish black like the rest of flagellum; proc. terminalis longer than segment III, 5½—6 times as long as basal part of segment VI; longest hairs on segment III slightly longer than basal diameter of segment. Rostrum (stylets) reaching to hind coxae; last segment about 0.18—0.20 mm long, about 1 1/3 times second joint of hind tarsi, with 7—10 accessory hairs. Legs evenly yellowish, to slightly brownish yellow, with the femora dorso-apically on distal 1/4—1/5 (hind legs) to distal 1/3 (fore legs) suddenly brown to blackish brown, tibiae similarly dark at the articulation, and on distal ¼ part; first tarsal joints with 5 or often, on some legs, with 4 hairs. Siphunculi evenly black, rather variable in length, from 2/9—3/11 of length of body, tapering from the thick base, with distal 1/3—1/4 part cylindrical and there 1 1/5 times as thick as mid portion of hind tibiae, with distal 1/4—2/7 reticulated, the rest to the very base slightly and inconspicuously imbricated. Cauda pale, ensiform and nearly 3 times as long as width at its very base, slightly blunt, with 12—18 hairs of two conspicuously different sizes, all with fine apices.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Rhin. on III	Siph.	Cau.
1	3.23	3.69	0.93	0.69	0.59	0.19 + 1.06	20 & 21	0.77	0.53
2	3.31	3.69	0.93	0.71	0.59	0.18 + 1.04	30 & 34	0.88	0.57
3	3.06	3.53	0.86	0.65	0.55	0.18 + 1.05	19 & 19	0.68	0.51
4	3.26	3.66	0.91	0.73	0.57	0.17 + 1.02	30 & 36	0.87	0.55
5	2.89	3.58	0.87	0.68	0.57	0.17 + 1.03	25 & 26	0.68	0.47
6	3.13	3.58	0.88	0.68	0.57	0.18 + 1.04	21 & 22	0.71	0.48
7	3.14	3.53	0.86	0.66	0.55	0.18 + 1.03	18 & 22	0.72	0.53
8	2.97	3.40	0.85	0.63	0.54	0.18 + 0.97	17 & 19	0.70	0.47

(1—8, from *Solidago macrophylla,* Gaspé Nat. Park, Quebec, Canada, 16.VIII.'65, leg. J. P. Sijpkens no. 94).

Oviparous female.

Like apterous viviparous female, but abd. tergite VIII with up to 8 hairs; hind tibiae quite yellow with short black socks, considerably swollen to up to 2½ times maximum width of other tibiae, with a great many pseudosensoria. Siphunculi thinner, from a thick base rapidly tapering to the cylindrical distal 2/3—3/4 part, rather scabrously imbricated from base to reticulated area. Cauda much shorter and also thicker.

Measurements in mm.

No.	Length body	Ant.	Ant. segments III	IV	V	VI	Rhin. on III	Siph.	Cau.
1	3.04	?	0.96	0.80	0.64	0.19 + ?	29 & 31	0.80	0.45
2	3.11	3.66	0.92	0.75	0.66	0.20 + 0.87	29 & 33	0.99	0.45

(1—2, with the apterae viviparae).

Discussion. The principal character of this species is the paleness of the legs. In quite a number of brown North American *Uroleucon* (formerly *Dactynotus*) the tibiae are partly pale and transparent on the basal half, at least in apterae viviparae. But then the hind tibiae in oviparae (as far as known) are evenly black. In *U. sijpkensi* the hind tibiae are yellow also in oviparae with only a small part at the apex blackish.

Dr. A. T. Olive, to whom I sent a slide, identified this as *U. nigrotuberculatum* (Olive). Biometrically it agrees with that species, also in the tiny dark marginal tubercles, but not in the pigmentation of the flagellum and of the hind tibiae which are blackish in paratypes, in other material identified by Dr. Olive, and in several Canadian samples. The siphunculi in viviparae of *U. nigrotuberculatum* are, with the exception of few often invisible imbrications on the underside very near the base, completely smooth to near the reticulated area. In *U. sijpkensi* they are very lightly imbricated in apterae viviparae, but conspicuously imbricated in oviparae.

Two apterae from *Solidago* sp. in Canada were sent to Dr. W. R. Richards in Ottawa who confirmed my suspicion that they were his *U. pieloui*. The apterae in that sample have a considerable part of the tibiae pale, but about halfway they become dark towards the apex. The oviparae have evenly black hind tibiae. The flagellum is black with only the very base of segment III paler. I have not succeeded in finding a difference between *pieloui* and the earlier described *U. hieracicola* (H.R.L.), of which *pieloui* may well be a synonym.

U. sonchellum (Monell) strongly resembles *U. sijpkensi* spec. nov. in the pigmentation of tibiae, but the femora are more extensively black at the tips, and the short siphunculi, and the extremely long ant. segment III with its many rhinaria exclude confusion with *U. sijpkensi.*

According to Dr. Sijpkens the aphids infested the inflorescences of their host. It is remarkable that oviparae, one teneral, the other old, were collected as early as the middle of August, together with the apterae viviparae.

The species is named after my compatriot and friend, the late Dr. J. P. Sijpkens, who made very carefully documented collections of aphids in many parts of the world.

Types. Holotype: apterous viviparous female (measurements no. 6, in one slide with an ovipara), from *Solidago macrophylla,* Gaspé Nat. Park, Quebec, Canada, 16.VIII.'65, leg. J. P. Sijpkens no. 94. Paratypes: apterous viviparous females, larvae and oviparae with collecting data as for holotype. Some paratypes in the collection of Dr. A. T. Olive, Winston-Salem, North Carolina, U.S.A.

TYPES

Unless otherwisely stated, types of new species and subspecies described in this paper are in the author's collection.

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